TECHNOLOGY DEPT.

Gas Journal

VOL. 289. 109th YEAR. LONDON, MARCH 6, 1957. Nº 4886. PRICE 1/6

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DETROIT

supremely swift

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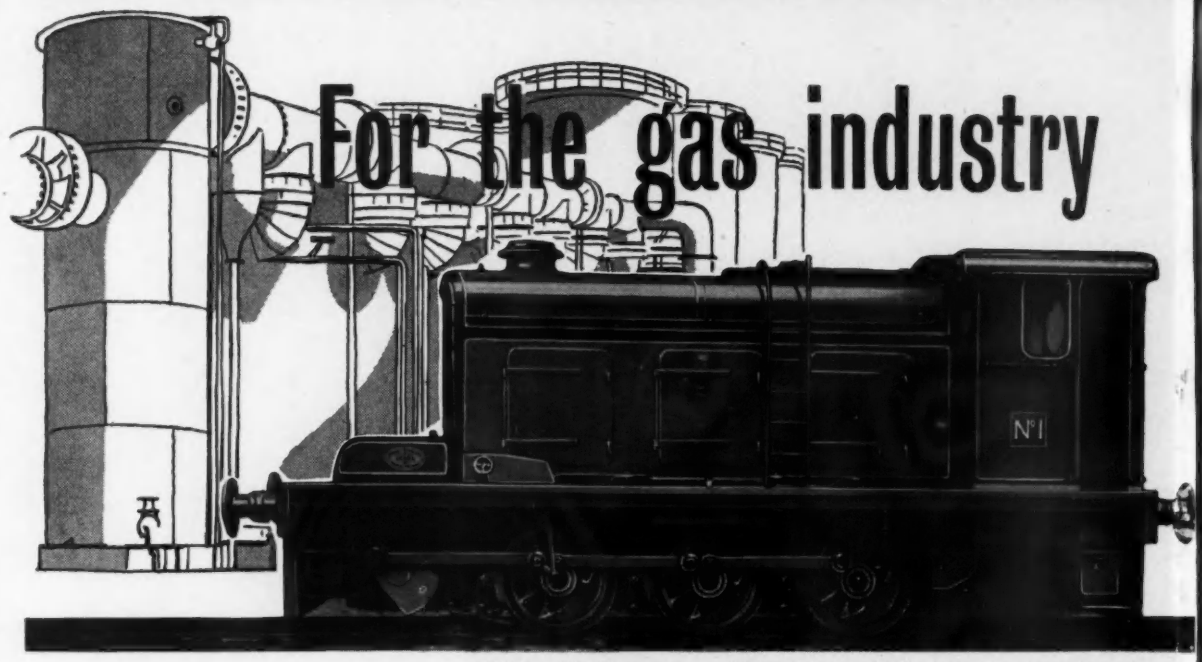
the new ASCOT 509

the thoroughbred

boiling water heater

ASCOT · 255 NORTH CIRCULAR ROAD · LONDON N.W.10.

For the gas industry



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A 200 h.p. Diesel Locomotive weighing 32 tons specially designed and constructed for the heavy and arduous service to suit the varied conditions in the Gas Industry. Designers and Builders of all types of Steam and Diesel Locomotives.

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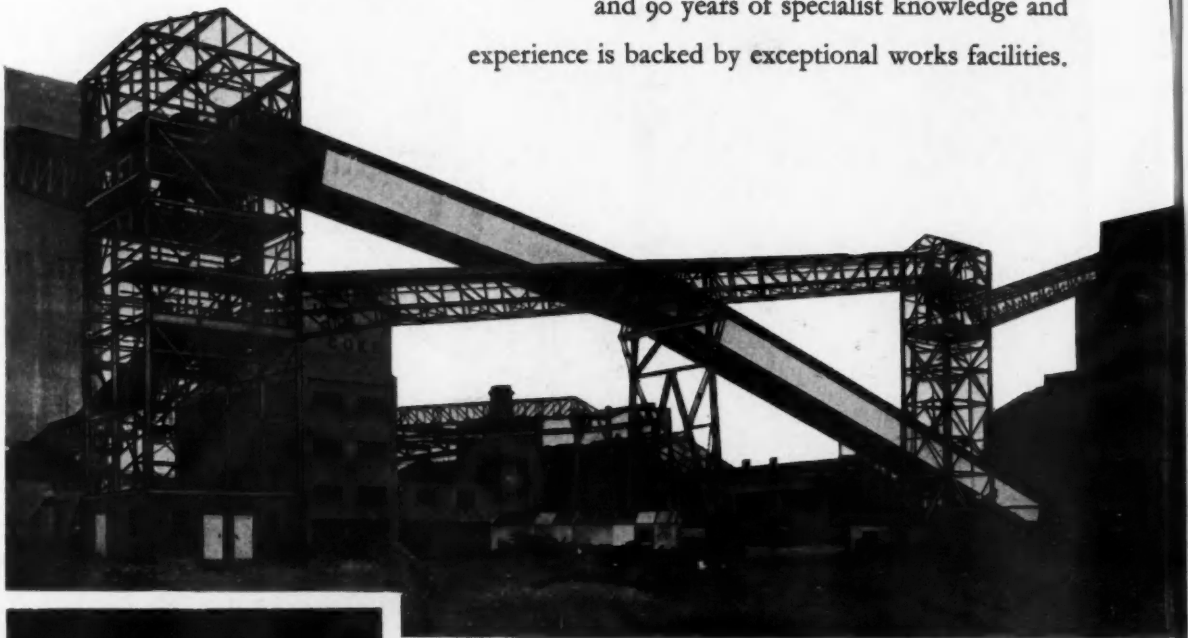
craftsmanship in steel...

Developments now taking place within the Gas Industry are designed to give benefits to industrial and public consumers alike. Long before these developments are complete and the benefits realised, detailed planning is called for in a multitude of ways. Not least is the supply and fabrication of structural steelwork and this has been Walker Bros. contribution to the new gas-making plant at the Walsall Works of the West Midlands Gas Board. We are highly organised to tackle any structural steelwork problem, large or small, and 90 years of specialist knowledge and experience is backed by exceptional works facilities.



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LIMITED
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if it can be built in steel—we can build it

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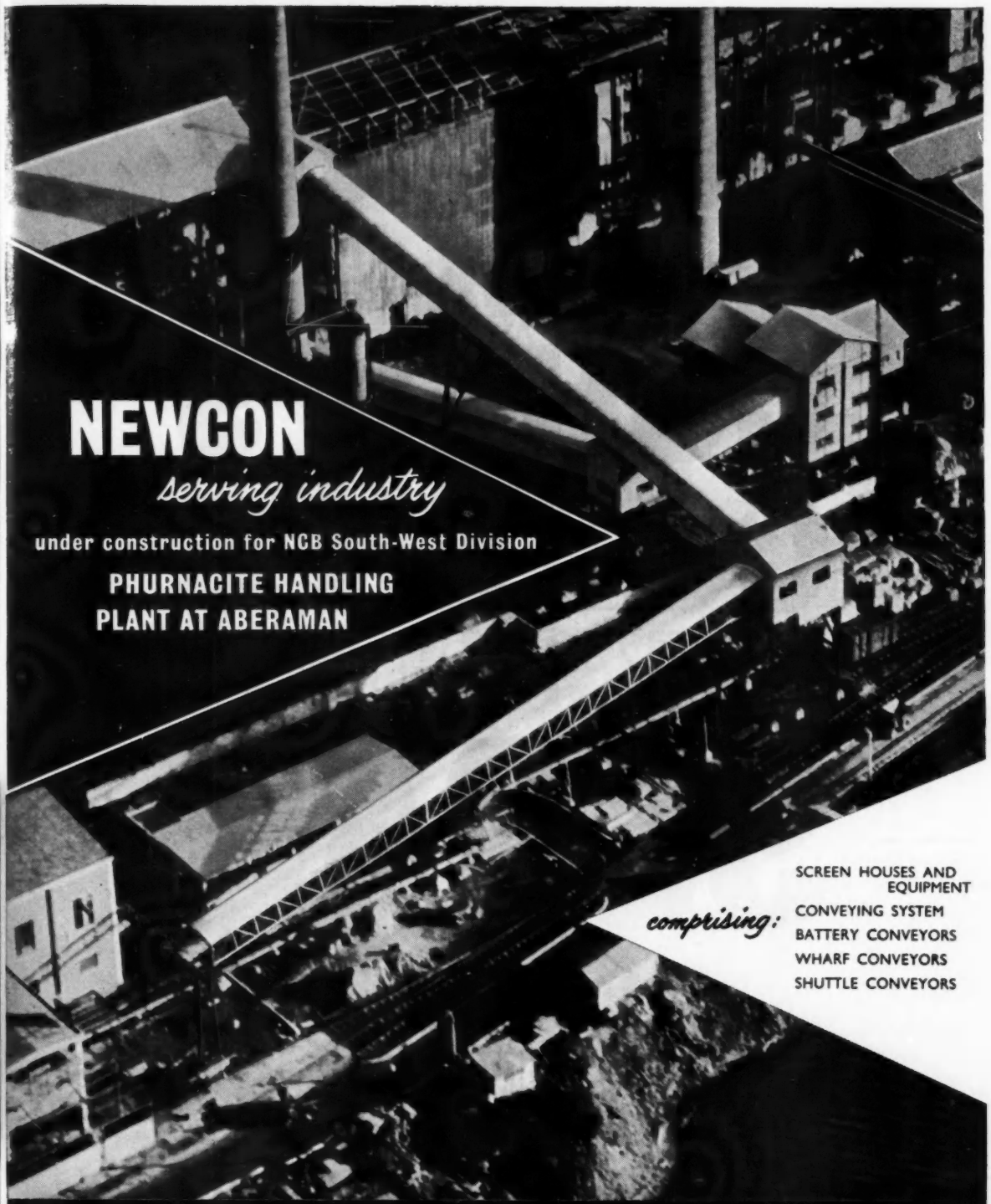

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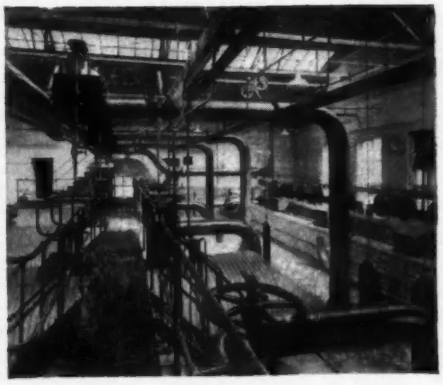
Planned Pipework Saves Money



The cost of additional steam raising plant to meet an increasing load, has on more than one occasion been saved by our replanning the pipework in conjunction with the fitting of Bolton-Gray Superheaters.

To report on your plant, giving you the benefit of our very long experience, would cost you— NOTHING.

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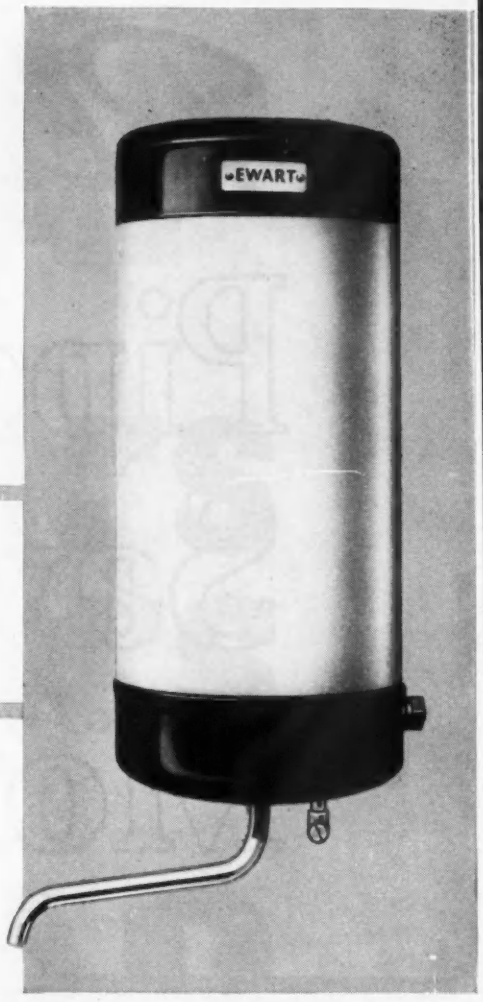
FOR REALLY HOT WATER CHEAPLY, QUICKLY

...the NEW EWART S.18

Storage sink water heater



POLISHED STAINLESS STEEL BODY

CHOICE OF COLOURS · QUICK ACTION
LOW COST · FOR ANY PRESSURES

Specially designed for the "small consumer" who wants piping-hot water quickly and cheaply, the new Ewart S.18 storage sink water heater offers a splendid hot water service at the sink for amazingly low cost. It provides 1¼ gallons at a time at 140°F or smaller quantities at even higher temperatures. When its full 1¼ gallons capacity is drawn off all at once, the S.18 will have the same amount of hot water ready again in 8 minutes. Smaller amounts take proportionately less time.

Made to the latest revised British Standard Specification, the new Ewart S.18 satisfies the gas industry's need of a smart, efficient, small storage sink water heater. Here are just a few of its strong points :-

STAINLESS STEEL BODY giving improved stratification. All-welded joints eliminate risk of damage through over-heating.

VIRTUALLY NO MAINTENANCE. There is no corrosion and no falling deposit from the S.18. It can be easily maintained with one spanner and a screwdriver.

THERMOSTATICALLY CONTROLLED. The S.18 is fitted with a newly designed thermostat so sensitive that there is no time-lag between draw-off and start of recovery.

FOR LOW WATER PRESSURES. The S.18 works perfectly on an extremely low head of water. A 10 ft. head of water gives ¾ gall/minute output: and a 5 ft. head, ½ gall/minute.

FOR ALL GAS GROUPS: The S.18 is fitted with a non-adjustable gas governor of one of two types for operation on different gas groups. Its burners are fitted with Bray miniature jets (types J or E). The fitting of the appropriate governor/jet combination by the manufacturers enables the S.18 to operate perfectly on any one of the four gas groups.

LIGHTWEIGHT AND HANDSOME. The S.18 is available with top and bottom caps in any of three attractive colours: light gold, rose-pink and black. Weight only 7 lbs. when empty.

EASILY FITTED. A paper template pinpointing the fixing centres is supplied with every heater.

ECONOMICAL OPERATION. With its quick recovery rate, the Ewart S.18 ensures really speedy water heating with less gas. It is thermally efficient, too,—10 per cent of the flue gas heat is utilised as a thermal cushion against heat losses.

MANUFACTURER'S LIST PRICE: £12·2·3 (Tax paid)

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fully described in our new TRANSITROL Type 994 data-leaflet available on request.

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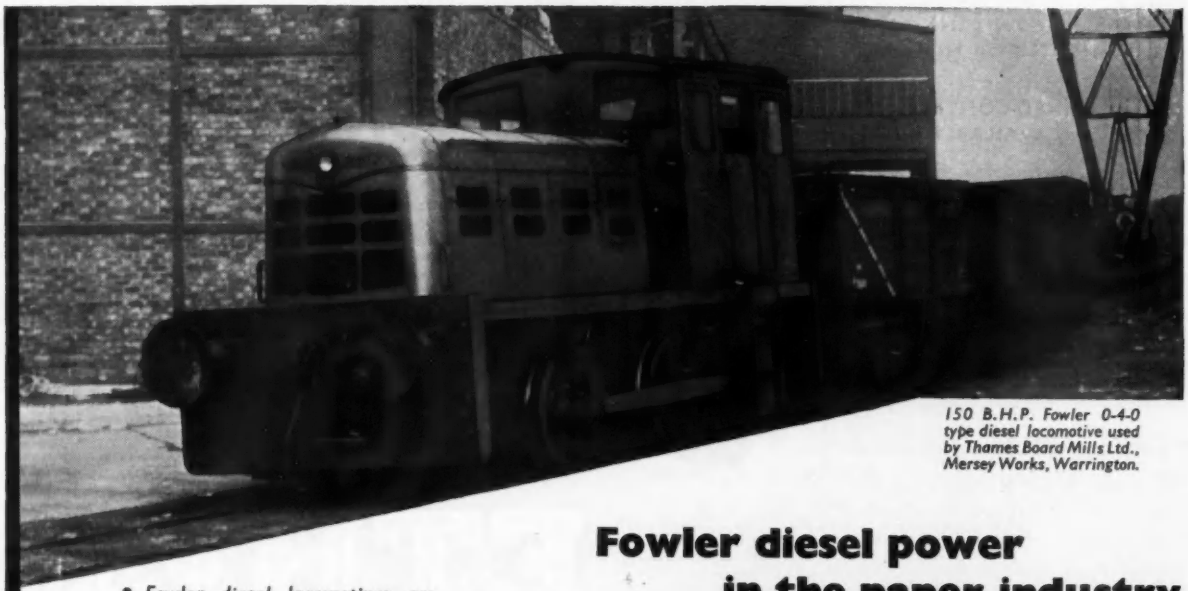

150 B.H.P. Fowler 0-4-0 type diesel locomotive used by Thames Board Mills Ltd., Mersey Works, Warrington.

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- *Fowler diesel locomotives are ideal for all industrial purposes, general or specialised.*
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ELECTRO-DETARRERS

For the New Gas Making Processes

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SITE	NO. OF UNITS	TYPE OF GAS	CAPACITY M.C.F.D.
*1 Kensal Green N.T.G.B.	1	Hot G.I. (Comp. Gasification) ...	12
*1 Kensal Green N.T.G.B.	1	Cold G.I. „ ...	6
2 Sydney, Australia	2	High B.T.U. Oil Gas	13
* Stratford N.T.G.B.	1	C.W.G. (Heavy oil)	15½
2 Watford E.G.B.	1	Complete Gasification	4½
* Surabaya (Indonesia)	1	ONIA-GEGI	4
*3 Warrington N.W.G.B.	1	C.W.G. (Heavy oil)	11
Ponders End E.G.B.	1	Segas	8
*3 Portsmouth S.G.B.	1	ONIA-GEGI	11½
2 Uxbridge N.T.G.B.	1	Segas	4
*4 Gloucester S.W.G.B.	2	Hot G.I. (Comp. Gasification) ...	15½
*4 Gloucester S.W.G.B.	1	Cold G.I. „ ...	10

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*Detarrers handling cyclic gas before the relief holders.
1 Plant ordered by Woodall Duckham Co. Ltd.
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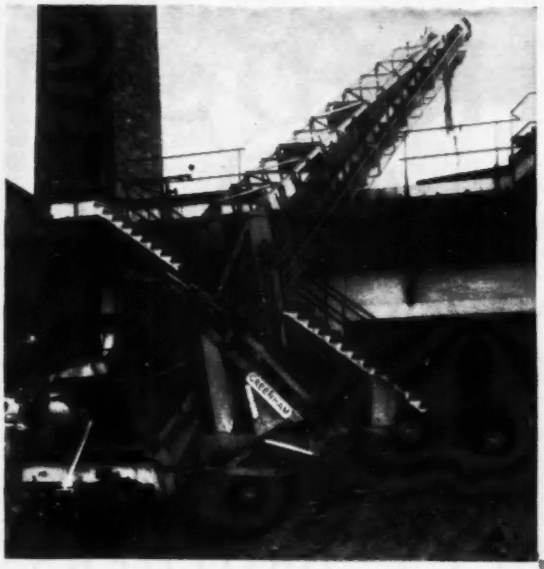
BTR CONVEYOR BELTING

Selected for Super Mobile Conveyor



'The 24" BTR belt on this 70 ft. Crone and Taylor Super Mobile Conveyor has heavy work to do, lifting oxide into the purifiers at a Gas Works. For oxide is a difficult load for belting—wet and clinging, with 20 per cent. or more of moisture, it is capable of tearing the slats out of all but the stoutest carcass — a real test of belt strength and of ply-to-cover adhesion.

But BTR belting is built to cope with the severest loads and conditions. This is why it is selected for this and other Crone & Taylor mobile conveyors and stackers—and why, indeed, it will pay *you* to select BTR belting.

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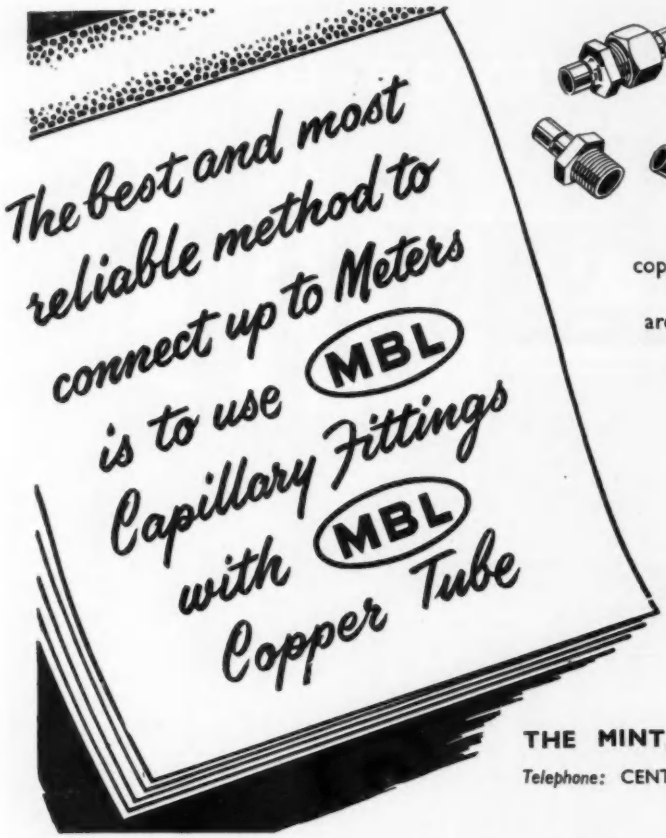

The special MBL range of Capillary Fittings for copper gas piping ensures neat, efficient and permanent joints. Made from ⅛" diameter to BSS. 864, they are specially recommended for use with MBL Copper Tubing made to BSS. 659. We are always pleased to offer advice and full details upon request.

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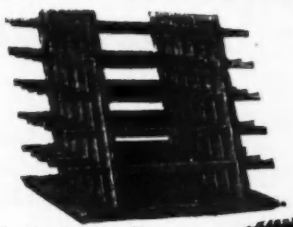

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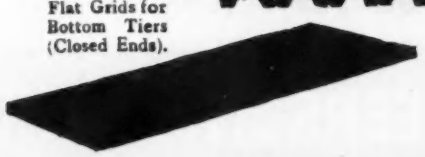

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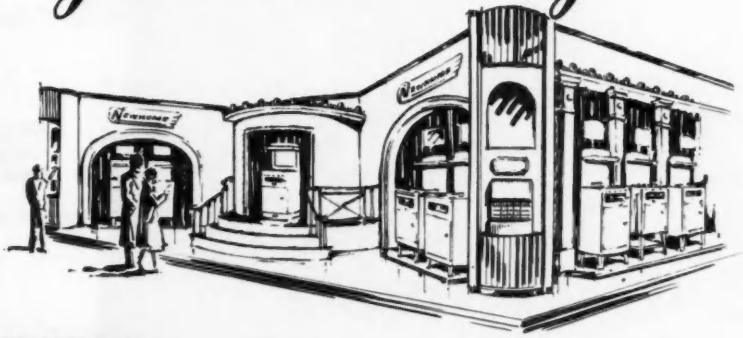

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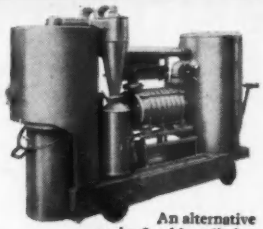

An alternative to the fixed installation is the B.V.C. portable heavy duty plant.

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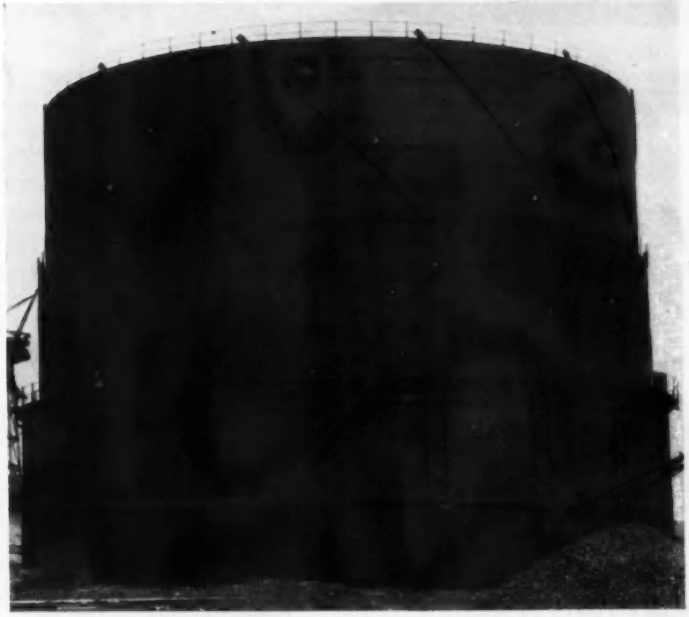

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3. Will not pick up usual oxide discoloration from water, thereby improving appearance.
4. Unnecessary to put Holder out of commission while being reconditioned.

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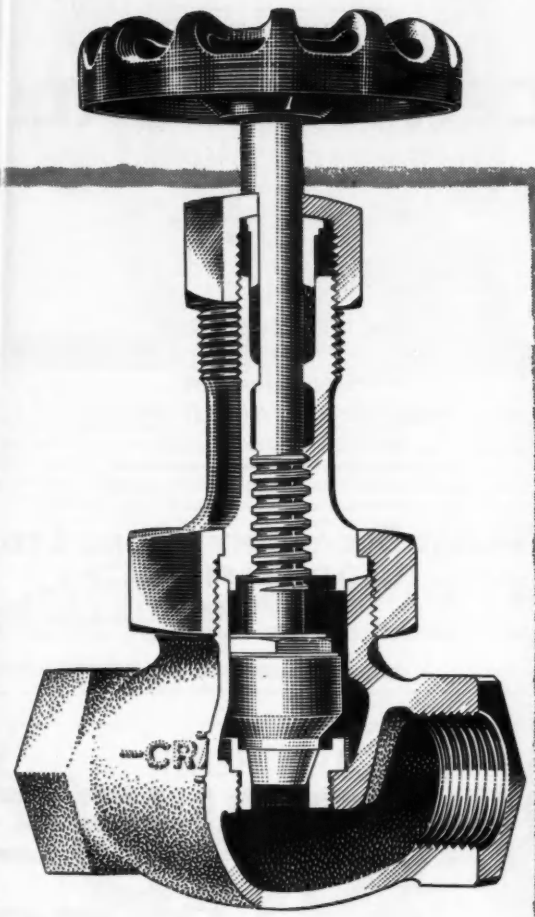

D46 Sizes: Screwed ¼"-3" Flanged ½"-3"

Screwed Hexagon ends with British Standard Taper Threads —or to American Standards. Flanged in accordance with British Standard Tables 'F' or 'H' diameters—or to American Standards.

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with renewable Nickel Alloy Disc and stainless steel seat ring

This Globe Valve, designed for services under really rigorous conditions, is one of a series of Crane Bronze Valves—all of reliable and sturdy construction. The plug type nickel alloy disc and the stainless steel seat ring effect an extremely tight closure whilst allowing close regulation of flow when throttling. The two dissimilar metals were chosen after extensive metallurgical tests as offering the best resistance to corrosion and 'wire-drawing' or damage by foreign matter. Both disc and ring are moreover renewable and additional discs and rings can be supplied.

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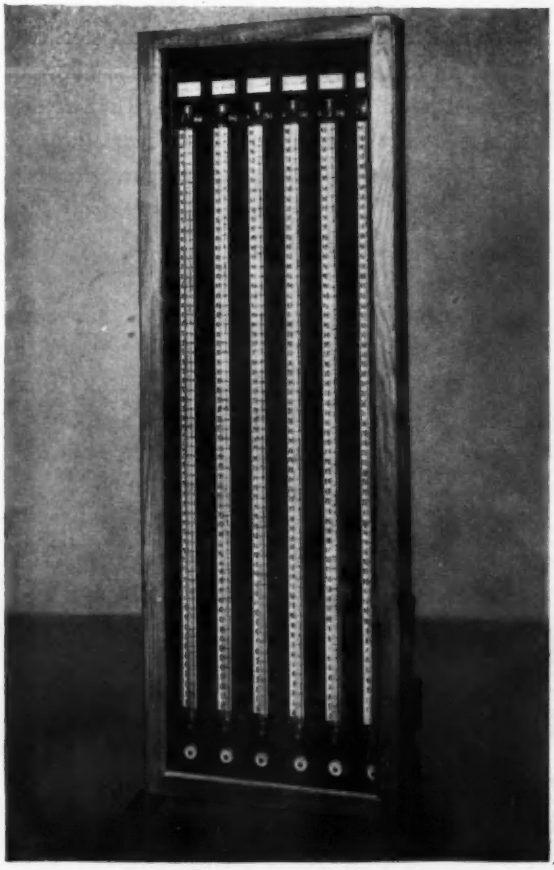

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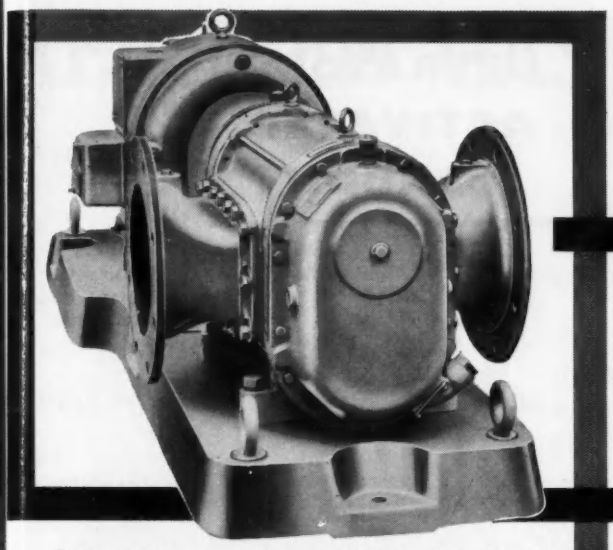
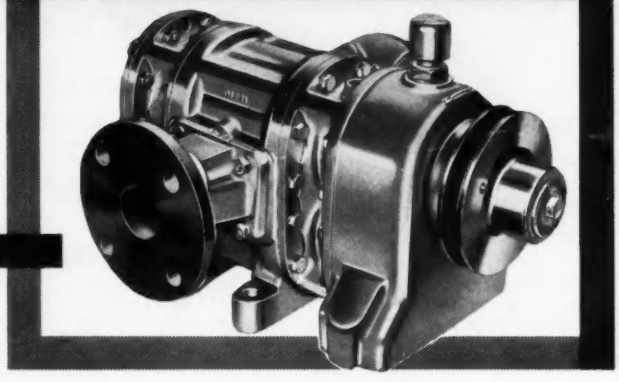


Godfrey Gas Boosters



Positive displacement gas boosters, designed and manufactured by Sir George Godfrey & Partners (Industrial) Ltd., are simple in construction, and easy to install. These machines are widely used in many industries for handling most commercially used gases, including towns' gas. Special sealing ensures freedom from oil contamination. Performance: Gas flow up to 3,500 cfm at pressures up to 10 psi. Also available: Industrial blowers, vacuum pumps, superchargers, diaphragm pumps, relief valves, etc.

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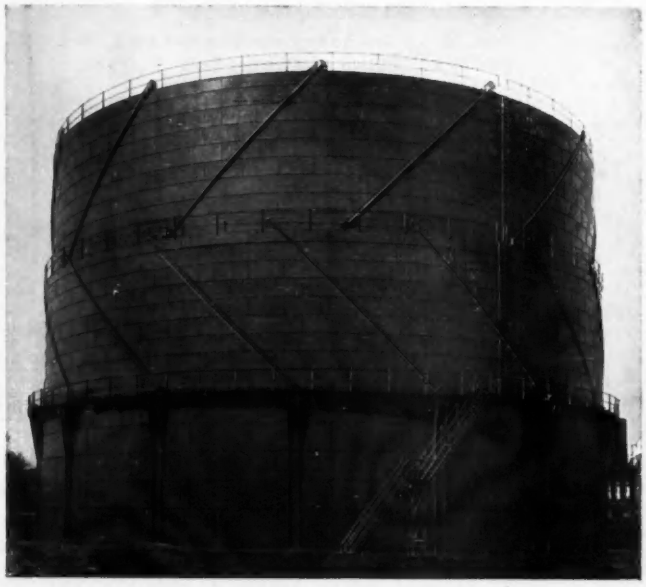

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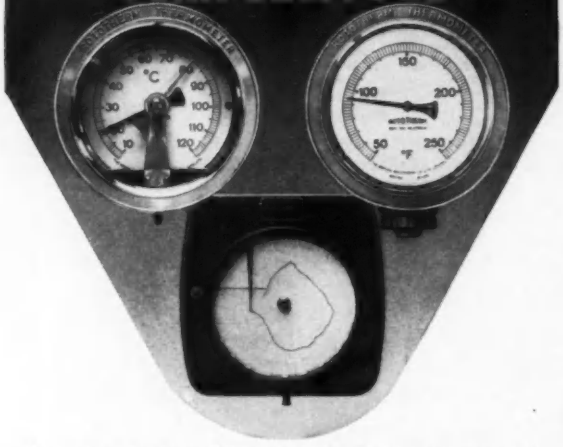

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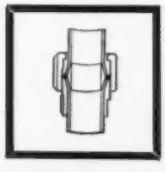

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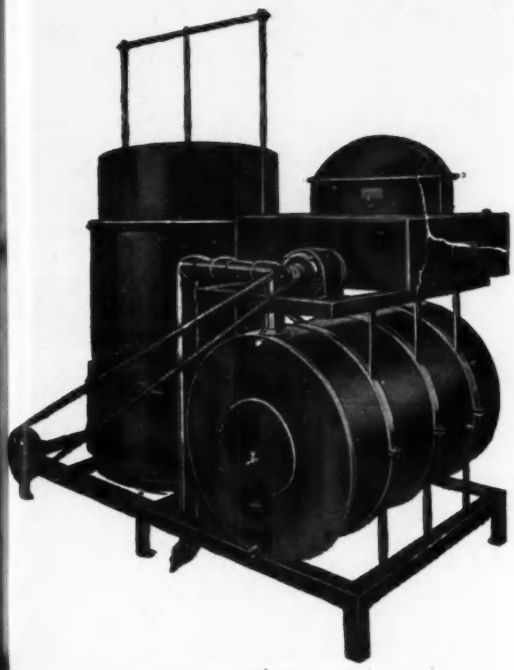

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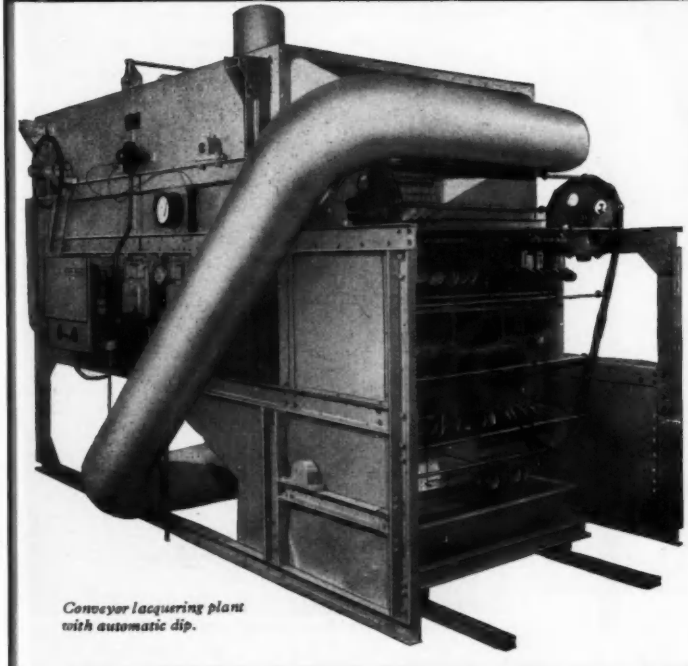

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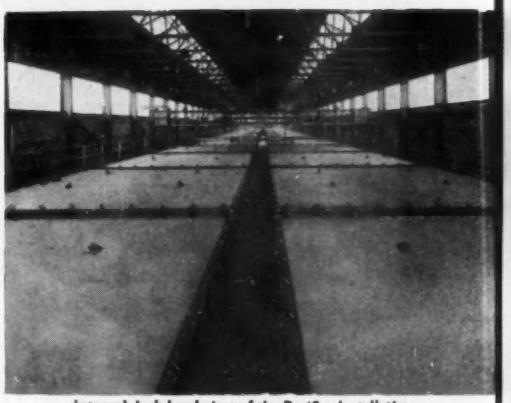

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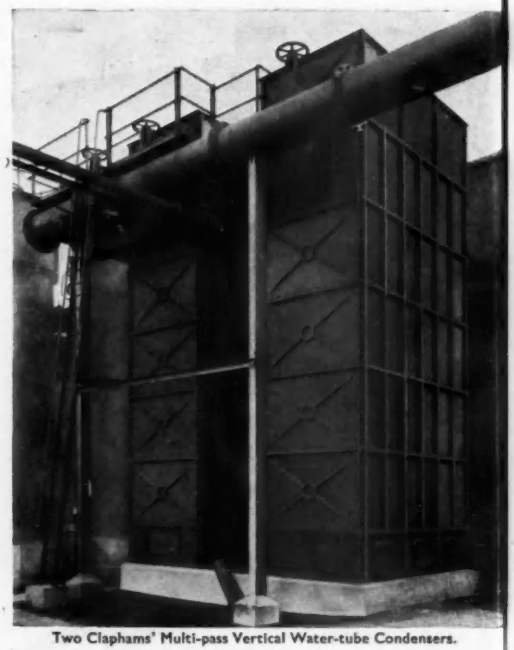

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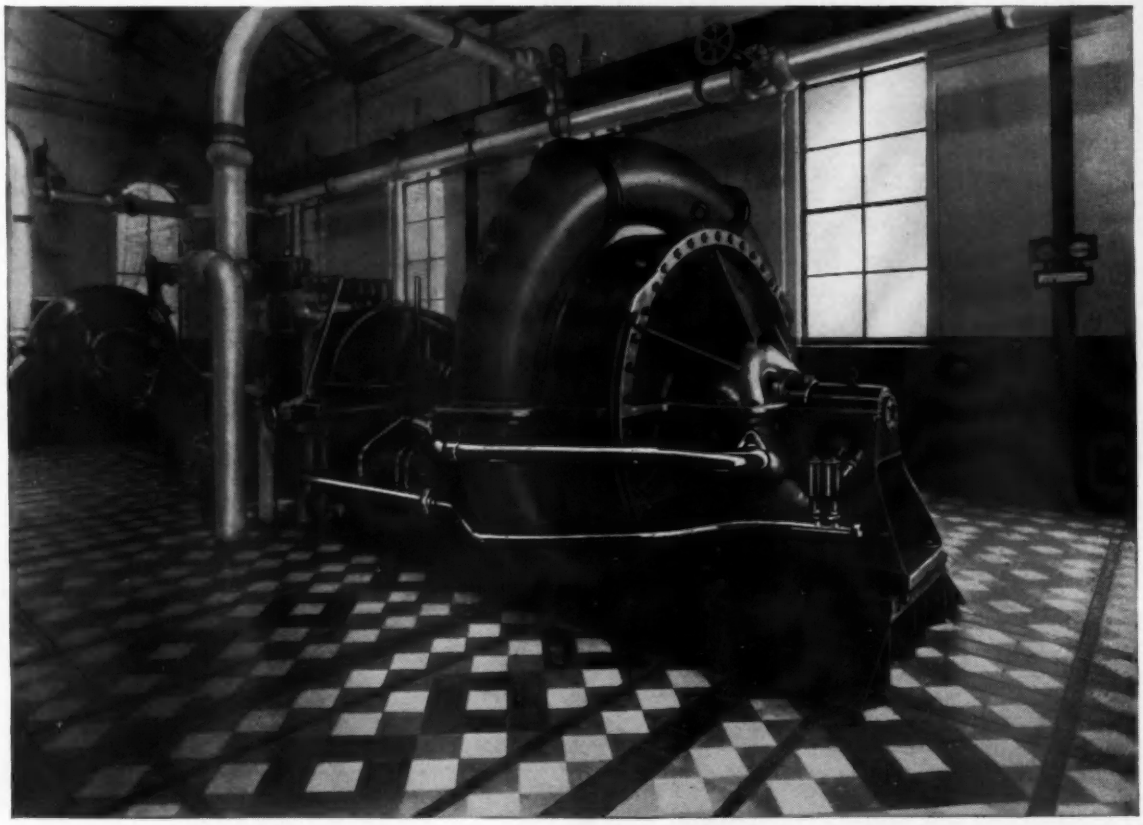

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Gas Journal

VOL. 289 *NO. 4886* *March 6, 1957*

109TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Geoffrey W. Battison

TECHNICAL EDITOR: Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M. Inst. F.

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Gas Journal

VOLUME 289. No. 4886. MARCH 6, 1957. 109th YEAR

Long-Term Energy Problems

THE new President of the Société des Ingènieurs Civils de France, M. Pierre Ailleret, is an electrical engineer of high standing in France. It was natural, therefore, that his Presidential Address of January 11 under the title 'Long Term Energy Problems and the Rapid Evolution of New Techniques' viewed these questions from the standpoint of electricity, but he did touch here and there on other aspects of the future of energy in the world as a whole.

At the beginning of the century, he said, it was normal to be gravely disquieted by the approaching exhaustion of the fossilised fuels bequeathed to us from the carboniferous period. But this view is out-moded by the recent rapid evolution of technology. 'Man lives in a *milieu* of considerable flux of untamed forms of energy.' It is not long since he began to domesticate them; falling water remained untamed until the last years of the 19th century and the first oil wells were sunk less than a century ago. Jules Verne foretold a goodly number of technological developments but he did not foresee those which have developed in the last few years. M. Ailleret had the impression that we too were more conscious of the growth of the demand for energy than of the possibility of the growth of our resources. The sun and the wind offered resources of the order of a kilowatt per square metre (say 10 sq. ft.), which represents 10,000 times the average requirements of France per unit of surface. Obviously a very small proportion of this natural source of energy would suffice. The unsolved problem is, how to recover it at a reasonable cost; a solution is not in sight.

The importance of the gas industry is dismissed somewhat cavalierly: 'Arising out of the single application to lighting . . . this application has practically disappeared.' After space heating, it is the metallurgical industries which, in France, are the biggest consumers of 'primary energy,' principally in the form of coke, 'a specific usage of coal, not properly speaking in the form of energy, which will follow the development of the consumption of steel.' This point of view is significant; it explains the present position of the gas industry in France which is more and more bound up with the position of coke, some for space heating but mostly for use in the iron and steel industries.

Space heating, electricity generation, metallurgy and transport by road and air, together absorb in France two-thirds of her resources in primary energy. The rest, which includes a diversity of industries and transport by rail, has varied for ten years around 35 and 40 million tonnes of equivalent coal. It appears to be stable, though the consumption of locomotive coal is diminishing with a slight increase in coal used to generate current for electric traction. M. Ailleret foresees rapid progress in the fuel demands of road transport, a threefold increase in 20 years in the requirements of electricity power stations, a slowing down of requirements for space heating, for which primary energy consumption tends to saturation, a growth in metallurgical coke demand following the development of steel, and a stagnation in other directions. 'All that leads to the forecast of a growth in the demand of total demand for primary forms of energy of the order of 3% per annum . . . something like one half of growth in the demand for electricity . . . corresponding to doubling in demand for primary energy in 20 years.'

The long-term demand must be met by the development of nuclear energy. But M. Ailleret sees a danger in going too fast. *Electricité de France* is going ahead with two plants, one of 60, and one of 100 megawatts, but the policy is to await experience with these before going further; 'premature duplications in France would not be justified by any question of the balance of importation of fuel. It is better . . . to devote the corresponding capital to accelerate the development of water power' until nuclear generation is further perfected.

The prospect of such development enables France to push on with hydro-electric development without any hesitation about the exhaustion of the possibilities in

that direction. It also justifies her in developing more quickly and on a greater scale the riches discovered in the soil in the form of petroleum and, above all, natural gas. The development of these resources will provide time for the realisation of nuclear power stations which can really provide electricity at costs equal to, or even less than, those obtained in the existing thermal stations.

An interesting point for the future is that France herself is well endowed with uranium in the Central Highlands and in La Vendée. 'We shall soon exceed the output of the Belgian Congo in uranium.'

It is clear from this picture that while in France as perhaps elsewhere the energy of the long-term future will be in the form of electricity—unless indeed in this rapid evolution of technique means are found to apply the heat released by nuclear fission in small units direct to the purposes required—it will be necessary to utilise the remaining fossilised fuels, coal and oil, with the utmost efficiency during the development stage of nuclear generation. And the gasification of coal, with oil for the peak loads, appears to have no rival for this interim duty.

Eastern Board Magazine

IN a recent issue we briefly discussed the aims and characteristics of some of the house magazines published by area gas boards. In the course of those comments we gave it as our opinion that the most successful of these publications was *T.D. News*, which is produced for and by the Tottenham Division of the Eastern Gas Board. This Board is unusual in that it sponsors three quite separate divisional magazines—*T.D. News*, *Contact* (Watford Division) and *Cambridge Gas Bulletin*. Now—rather belatedly some might think—those divisional publications are being coalesced into an area magazine. The reason for the change has been given by Sir John Stephenson, Chairman of the Board, in these words: 'We are now faced, first with economy, and secondly with the need to get rid of the conception that we are living in isolated compartments as divisions. We are not isolated compartments; we are all part of the Eastern Gas Board. I am not decrying the divisional organisations, but it now seems to me that we have got to the stage when we might develop a type of area publication which would not eliminate entirely the local interest but would create an area outlook and at the same time effect some economies.'

There is no doubt a strong case for a magazine serving an area gas board as a whole; that is a viewpoint which seems to be held by most boards. At the same time we are not greatly impressed by the ability of these area magazines to really foster an area-wide outlook, a real feeling of unity. Divisional magazines certainly appear to be a luxury, but when one considers the possible advantages to be gained in terms of morale, efficiency, etc., expenditure on them may not be so unreasonable. Strange that nobody seems to have conceived an area magazine in which are included substantial divisional supplements.

Gas Industry Goldwyn

THE moment Mr. R. J. Gregg starts using a script writer we shall know immediately. The products of his prolific pen are many and various but they all bear the Greggorian stamp and exhibit the Greggorian weakness—a psychological inability to resist making use of any wisecrack which comes to mind. That the discourse on sponsored films which appeared under his name in a recent issue of *Advertiser's Weekly* is the genuine article is immediately apparent, and reading it those who know him well can, as it were, hear him speaking. The sledgehammer humour is there but so is his other characteristic—the sound common sense which underlies most of his literary excursions. Here is an example: 'The making of any privately sponsored film is a serious matter and one which concerns the ultimate trading account. A two-reel film may cost anything between £2,000 and £20,000 or more, and from the basic idea conception onwards, the less interference it receives from all those in the "dear old firm" who obviously *always* know best, the better for all concerned—not forgetting the potential audience. It sometimes happens with a press advertisement layout that the client only sleeps in peace as and when it appeals to *him* and not to the consumer. This may well be a human fallibility, a process of self-adulation, or just a cock-eyed complex but, most certainly, it is an expensive funeral service—and not only for the product, but also for the ulcerated agent.'

Of course, Mr. Gregg must bear in mind the fact that it is unwise to sidestep the 'dear old firm' entirely; there have been some sponsored commercial films which, although technically well produced, somehow missed the whole object of the exercise. Fortunately for us Mr. Gregg's celluloid lilies do not come into that category, and in his article he very rightly describes some of his successes. After all, within the last six years the Gas Council has increased its selective audience from 1½ mill. to 6 mill., and that is something to be proud of. Moreover, it is not without significance that the man chosen to write on sponsored films in the advertising industry's journal is the Gas Council's Publicity Manager; that suggests that in the sponsored film field gas has a place of honour.

Long Smokes and Puzzled Rats

MR. LESLIE HARDERN, the North Thames Gas Board's Public Relations Officer, is better known to the public as the chairman of television Inventors' Club. In 1954 he harvested the crop of wonderful ideas that programme produces by writing a book which was in effect a history of the club. Well-illustrated, the narrative was designed to hold the interest as a novel does, with Mr. Hardern's writing to help the pace: 'With desperate glances at the clock, we chose what we thought was the right one. A woman answered, and when I asked for her husband, she said that he was in his bath.' In short, it gripped.

But Mr. Harden's follow-up, *Easy Living* (Robert Hale Ltd., 10s. 6d.) is much more specific in purpose. No husbands in the bath, unfortunately, and certainly no desperate glances at the clock. The book's sub-title is '300 Ways of Making Your Home Easier to Live In,' and that is precisely what it is—a description of inventions that have appeared on Mr. Hardern's programme, concisely set out under separate chapters. Everybody should find something in it of use, whether it be a delightfully ambiguous 'cigarette holder for long smoking,' a practice putting device, or more profoundly, a 'wild bird and rat puzzler.'

Personal

MR. E. G. BROOKS, General Manager of the Potterton Division of Thomas De La Rue & Co. Ltd., attended the annual meeting of the American Society of Heating and Air-Conditioning Engineers in Chicago last month, representing both the Company and the British Institution of Heating and Ventilating Engineers in support of its President, MR. CLIFFORD BYLES, who was present at the personal invitation of the President of the American Society, MR. JOHN W. JAMES. Mr. Brooks will go on to Australia, leaving on March 14, to explore the possibility of exporting and arranging for local production of gas fired boilers manufactured by the Company, and will also visit New Zealand, Karachi, Teheran, and Beirut.

MR. F. H. G. HIGTON has been appointed Sales and Service Manager for the East Kent Division of the South Eastern Gas Board covering Dover, Folkestone, Margate, Ramsgate, Canterbury, and other parts of East Kent. The Divisional office will be at Ramsgate. MR. F. E. F. SALTER has been appointed Sales and Service Manager of the Medway Division covering the Medway towns, Maidstone, and other parts of West Kent. The Divisional office will be at Rochester.

MR. W. W. SCOTT, who for the past 12 years has been London Representative of R. & J. Dempster, Ltd., and in charge of their London Office, has been appointed Contracts Manager at their Head Office in Manchester. MR. H. C. ARMITT, who has been Mr. Scott's assistant, becomes London Representative in charge of the London Office.

MR. FRANK BONE, B.E.M., yard foreman at Crewe gasworks, has retired from service after 37 years.

MR. J. E. CLARK will represent Henry Slack & Sons Ltd. in Scotland from April 1.

Obituary

MR. JOSEPH B. CRAGGS, Manager of New Brancepeth coke ovens, has died aged 60. He had been connected with the coke-oven industry from the age of 11, and was Under Manager at New Brancepeth for 30 years, before being promoted Manager.

MORE COKE IS SOLD IN THE NORTH WEST

JANUARY gas coke sales in the North West were 5.3% more than in January last year, states the North Western Gas Board. This is the third month in which increases have been recorded; in the November-January period sales were up by 4¼%.

Over the ten months up to and including January, however, coke sales have fallen by 2.8% compared with the equivalent period of 1955-56. Main reason for the rise in recent months has been increased exports.

Geo. Wilson—Radiant Heating Showroom Gets Official Send Off

OPENING BY N.W.G.B. DEPUTY-CHAIRMAN

THE new office and showrooms of George Wilson Gas Meters Ltd., and Radiant Heating Ltd., at 33, King Street, Manchester, 2, were formally opened on February 26, by the Deputy Chairman of the North Western Gas Board, Mr. W. Hodkinson, O.B.E.

During lunch, at the Midland Hotel, Mr. Hodkinson said that many of the industry's developments over the past 100 years had originated from contractors.

The production and selling side of the industry were facing probably the most difficult period in their history—a period which might last for another five or six years—but conditions for contractors were even more serious.

'I am worried,' added Mr. Hodkinson, 'because if our contractors feel the desire to go over to other industrial activities then our future is not too bright. If, on the other hand, we and you can retain our present positions, and perhaps in the next five years improve on them and hold our load, we may view the future with a good deal of confidence.'

The industry was on the threshold of revolutionary discoveries, the important thing was to 'get cracking on development work in a really big way.'

Concluding, Mr. Hodkinson said he was delighted that Geo. Wilson Gas Meters, Ltd., and Radiant Heating, Ltd., had the foresight and the courage to open new premises in Manchester, and he wished them every success.

Mr. W. D. Wilson, Chairman, Geo. Wilson Gas Meters, Ltd., said it was now 41 years since his Company first came to Manchester.

Closest Liaison

He went on: 'Obviously, it will be our intention and endeavour to continue to work in the closest possible liaison with the North Western Gas Board and with the three other boards this northern office and showrooms are designed to serve, *i.e.*—the Scottish, Northern and North Eastern Gas Boards.

'In the main the showrooms will, as you have seen, be largely devoted to the products of our subsidiary Company, Radiant Heating, Ltd., which is a most successful concern under the dynamic leadership of Mr. Arthur Docking. Perhaps the greatest advantages of the showrooms will be in the catering field, which it is our intention to develop fully and have available the appliances here for demonstration in this field and in all others.'

Mr. A. Docking, Managing Director, Radiant Heating, Ltd., gave a supporting speech.

SAFETY TAPS URGED FOR GAS FIRES IN NURSING HOMES

KEEPERS of registered maternity and nursing homes in Croydon are being advised by the Council's health committee to fit gas fires with safety taps.

This follows a death from carbon monoxide poisoning which occurred recently in a nursing home owing to a gas fire having been turned on and left unlit. Homes are being urged 'to minimise the risk of accidents of this kind.'

The committee has also decided to make it a condition of registration that safety taps should be fitted, and has asked the South Eastern Gas Board to inspect and report on gas installations of all registered maternity and nursing homes in the borough.

Diary

March 13.—SOUTHERN G.C.C.: Civic Centre, Southampton, 11 a.m.

March 13.—SCOTTISH WESTERN JUNIORS: Institution of Engineers and Shipbuilders, Elmbank Crescent, Glasgow. 'Treatment and Disposal of Trade Effluents,' Dr. S. H. Jenkins. 6.30 p.m.

March 14.—SOUTH EASTERN G.C.C., METROPOLITAN DIVISION: Council Offices, 4/6, Wandsworth Road, S.W.8. 2.30 p.m.

March 15.—MANCHESTER AND DISTRICT SECTION, I.G.E.: Engineers' Club, 17, Albert Square, Manchester 2, 2.30 p.m. 'Oil Gasification at York by the Segas Process,' F. H. Nicholls.

March 16.—LONDON AND SOUTHERN JUNIORS: Visit to South Eastern Gas Board, Sydenham works.

March 19.—LONDON AND SOUTHERN SECTION, I.G.E.: Pepys House, Rochester Row, London, W.1. 'Contractors' Delivery Promises and their Fulfilment,' I. H. Phillipps.

CANNOCK TO CLOSE? IT'S JUST A RUMOUR

RUMOURS that Cannock gasworks are to be closed following the dropping of a £750,000 development scheme were denied by the West Midlands Gas Board last month.

Failure of negotiations with the National Coal Board for measures to prevent mining subsidence was one reason for the extension scheme being abandoned, and it is now planned to lay a large inter-connecting main from Walsall to meet increased industrial demand expected in the Cannock district.

This scheme, however, will not be started until 1959 or 1960, and will take about a year to complete.

'Mel' at the Ideal Home Preview

ARTHUR PUGH, "DAILY EXPRESS"
ERNEST ATKINSON, London Editor, "BIRMINGHAM POST"
BRIAN JOHNSTON, B.B.C.
C.H. LEACH, Chairman, Southern Gas Board.
D.P. WELMAN, Ch. N. Western Gas Board.
SIR HAROLD SMITH, CHAIRMAN, THE GAS COUNCIL.
JOHN GORDON, Editor-in-Chief, "SUNDAY EXPRESS"
SIR HARRY BRITTAIN.
L. STOKES-ROBERTS, ORGANIZER IDEAL HOME EXHIBITION.
BRIAN HARPUR, Manager, "EVENING NEWS"
HENRY CLAPP, Managing Editor, "DAILY MAIL".
C.H. CHESTER, Chairman, South Western Gas Board.
R.S. JOHNSON, Chairman, E. Midlands Gas Board.
MEL 57

Now Gas Goes To Market

Fine Show at this Year's Ideal Home

MOST appropriately the theme of the Ideal Home Exhibition this year is a market, and the Grand Hall has been transformed into an enormous market-place in which spired and pinnacled stands surround a handsome fountain. Taking their cue from Mr. James Gardner, the exhibition's Chief Designer, the Gas Council has produced 'Mr. Therm's Modern Market' in which every gaily decorated booth has its special line in appliances. Having chosen their 'buy' visitors can complete their purchase in a spacious and comfortable lounge. Since bargain hunting is one of the chief attractions of all markets the central feature is the 'Buy of the Day' in which three new gas appliances are displayed in turn; each model—cooker, water heater and refrigerator—represents, to quote the Gas Council, 'a bargain in life-long comfort and beauty for the home, at a reasonable cost.'

By far the most eye-catching feature is a display in which a separated hot-plate and oven light automatically and give a fine control from fierce heat to pin-point simmer, the results being revealed by cut away pots with gauze bases. Another attractive idea is the press-button kitchen which answers kitchen planning queries. Visitors can touch any button and immediately each piece of kitchen equipment is illuminated in its correct position to give an easy working kitchen. Certain of an interested response from 'bachelor girls' and other one-room and flatlet dwellers is the kitchen in a cabinet which contains a fully equipped small kitchen complete with a Junior General cooker. The interior of the cabinet is lined with washable heat-proof cream tiled masonite and is fitted with plate-rack, shelves and tablecloth. A ventilated storage cupboard takes food stores and there are fitted racks for cooking utensils. A safety device prevents the doors being closed until the gas is turned off. The cabinet is being produced by Argus-Archer.

The stand itself is well up to the Gas Council's usual high standard of design and compares very favourably with the electricity counterpart across the gangway, mainly because of its greater simplicity and open plan. Good design is also a feature of the Council's home laundry stand in the Grand Hall Gallery where home service advisers are giving demonstrations on the use of gas-electric washing machines. Gas drying cabinets are also being used and visitors will no doubt be impressed by the fact that a full-size cabinet will dry an average wash —14/16 lb.—of wet clothes in about an hour. Competition is fierce up here because all the electric washing machine manufacturers are present in force.

Gas is well represented in the Ideal Village where there are no less than 19 gas and coke appliances, while in the Bon Viveur kitchen a dazzling array of gas equipment assists this famous team in their presentation of Cordon Bleu cookery. Appliances include a Parkinson Mark V1 Renown cooker, a Cannon A130 S.G. cooker with side grill, a Briffault spit, an Electrolux L500 refrigerator, and an Ascot 509 sink water heater. Two Cox bakers ovens and an Ascot bakers model multipoint are installed on the Hovis, Ltd., stand, a Cannon A125 cooker, Flavel Leamington hotplate, and Ascot 509 sink water heater are in use on the Danish Agriculture stand, and a considerable number of gas water heaters are to be found operating in other parts of the exhibition.

The high standard set by the Gas Council is well supported by the gas appliance manufacturers who make up what is normally called the Gas Section, although its boundaries appear to be less readily defined this year. One of the most pleasing characteristics of this section is the fact that the exhibitors are determined to really live up to the market theme; every stand is designed for hard selling and sales figures for the run of the exhibition should be good.

Always noted for their contemporary design, Thomas de la Rue and Co. Ltd. (Potterton Division), maintain their standard this year with a first-class display of 'Diplomat' gas and oil fired boilers and Warwick cookers. This company is developing its gas and oil boiler sales side by side, determined to get the maximum results from both fuels. Four gas-fired models are displayed, the two smallest, 'Diplomats' 30 and 34, being well established, and the two largest, 'Diplomats' 66 and 100, being the latest additions to the range. A particular feature of the appliances is the smooth styling and pastel colours. The Warwick gas cooker is by now an old friend and with its eye-level grill and plate-rack, five boiling burners and large oven is unique in its particular field.

Humour as an Aid

Ascot Gas Water Heaters Ltd. have a stand on which good display is allied to humour. Revolving panels form cartoons, one of them for example showing an unfortunate white hunter watching the cannibal chef testing the water heating in the pot with his elbow. Needless to say, the caption suggests that the job could be performed more efficiently by gas. Tap-to-teapot boiling water supplied by the latest Ascot boiling water heater, type 509, is strongly featured and also displayed are small sink water heaters, bath water heaters and multipoints. Subsidiary displays show portable fires, and boiling rings together with Compoflex gas tubing in a variety of colours.

Stoves Ltd. exhibit two particularly interesting new appliances. One is the Newhome X5 cooker which has an open glide-over top, four rapid action burners and a forward flue vent in the splash back which permits flush fitting to the wall. The other is the Landmark radiant convector fire which lights up automatically and incorporates a flame-failure device in the ignition system. Other cookers shown on the stand include the X3, X2, etc.

Sydney Flavel and Co. Ltd. appear to be star struck, since their stand is star shaped and has a 'night sky' ceiling. Coloured drapes match the range of colours available on the cooker taps of their Envoy cooker which is the only appliance displayed on their main stand.

(Continued on p. 505)

A Preview for the Press

THAT the Press have a high regard for the activities of the Gas Council's Press and Information Office is apparent from the remarkable amount of publicity given to gas news in newspapers, women's magazines and trade journals. No gathering is more popular or enjoyable than the party which precedes the Ideal Home Exhibition at which the Gas Council introduces to a large and distinguished gathering of Press representatives the outstanding new exhibits to be shown. Last Thursday at Caxton Hall 26 new items of equipment were introduced, and those present had an opportunity to examine a model of the Council's attractive Gas Pavilion.

Sir Harold Smith, Chairman of the Gas Council, referred particularly to the 'Auto-Range' produced by General Gas Appliances Ltd., which is the first fully automatic gas cooker, and to the Bratt Colbran 'Director' portable fire in which the flame goes down immediately to a tiny pilot if the appliance is tipped over. However, Sir Harold took the opportunity to put in a word for purchase tax reduction and the removal of hire-purchase restrictions. It was no use, he said, manufacturers producing fine appliances if householders could not afford to buy them. What they wanted above all things was the removal of purchase tax on gas appliances and the removal of the restrictions on the hire-purchase of those appliances. 'In effect what we have today is a purchase tax on clean air and on healthier living.'

In closing, Sir Harold paid a well-deserved tribute to the work done by Miss Dorothy Polini, the Assistant Press and Information Officer,

Metamorphosis in the South West

C. H. CHESTER, *Chairman of the South Western Gas Board, in an interview with the 'GAS JOURNAL' answers questions on the Board's progress since nationalisation*

Q. Mr. Chester, before we talk about particular aspects of the South Western Gas Board, may we consider the area it serves as a whole? It is unusual in a number of ways—would you like to comment?

C.H.C. Well, of course the most striking thing about it is its shape and, more particularly, its length. When you consider that it extends for 250 miles from Evesham, in the North to Penzance in the South West, from a geographical point of view it is obviously a difficult area to control. Not only is travelling time a problem, but there is the fact that this long, straggling territory has a low density of population—remember there is only one area gas board with a larger area to supply and only two with a lower density. And remember too that with Dartmoor, Exmoor and the Bodmin Moors we have some pretty difficult and unrewarding country to cope with. Apart from Plymouth and Bristol, which each have a population of over 100,000 it is mainly an agricultural area and our 645,000 consumers are dispersed in relatively small towns and villages. On the other hand we have the benefit of numerous holiday resorts on our long coast line with a well developed and expanding demand for gas for catering purposes.

Q. What about the state of your area when you took over at vesting date?

C.H.C. At nationalisation there were some 104 separate autonomous bodies operating 108 gasworks with a total annual output of 25,500 mill. cu.ft. of gas, but the gasworks varied in annual output from a maximum of 5,900 mill. cu.ft. to as little as 2 mill. cu.ft., the majority being relatively small. The undertakings generally, and the gasworks in particular, had suffered seriously, though perhaps not superficially to any extent except in one or two cases, through the strain of maintaining and expanding production during the war with insufficient and often unskilled staff and inadequate maintenance. Many of the smaller works in particular were not only out of date, and therefore inefficient by modern standards, but their physical condition, like the quality and pressure of the gas they supplied, was poor and little or nothing had been provided in the way of reserves for rehabilitation.

Q. What about the condition of the plant?

C.H.C. In spite of certain additions, during and immediately after the war, the maximum daily capacity of coal gas plant only rose by 20% between 1939 and 1948 as compared with an increase of 40% in the total annual output of gas, the balance of capacity being made up by an increase of 80% in water gas plant, which in some places was being operated continuously. At vesting date the average age of coal gas plant was 22½% higher than before the war, and the proportion of water gas made was, in many places, far in excess of the generally accepted standards. In most works the reserve capacity of plant was much below the minimum necessary to meet both expanding demands and either exceptionally cold weather or unforeseen emergencies.

Q. We'll come back to the plant in a moment. First, however, it might be appropriate if you said a word about the form of organisation which was adopted in order to deal with the situation as you found it in 1949.

C.H.C. In the early stages it was thought advisable to fashion an organisation with the minimum initial dislocation of existing systems of control, except at the highest level. Decentralised control was applied in all matters not involving Board policy. The eleven Sub-Divisional Managers met monthly in their two Divisional Executive Committees, implemented Board policy, approved revenue expenditure within the limits of a budget, approved the smaller projects for capital expenditure, and recommended the projects for larger amounts to the Board for final sanction. In their Sub-Divisions the Managers controlled, within the policy set by the Board, all the functions of the production, distribution and sale of gas and coke, together with the collection of the Board's revenues and the accounting for income and expenditure.

Q. How long was that set-up practicable, and in what way was it ultimately changed?

C.H.C. The scheme worked very happily for the first five years of nationalisation, despite the continuously changing conditions. During that time we achieved a lot: The supply and quality of gas throughout the area were improved; a large expansion was achieved in sales of coke and appliances, particularly cookers and water heaters; the Board's revenue and expenditure were kept in balance to a large extent by greater technical efficiency and operational economy; over 3,500 detailed projects were prepared and approved, involving capital expenditure of over £20 mill. during a period of ten years, and 19 works out of the original 108 were closed down as a result of integration. However, towards the end of the first five years there were signs that the gradual integration of works involving the transfer of gas over long distances and the constant need for greater efficiency to counteract rising prices, were exerting strains which the organisation was not designed to meet. The Board, therefore, set up a committee of senior officers in the early months of 1953 to investigate the existing management organisation and to recommend any desirable changes. After much investigation and consultation the committee made certain major suggestions which, with some modification, were accepted by the Board. The new organisation, which came into operation in April, 1954, divided the Board's operations into three main functions—production, distribution and consumer service (including all sales), and accountancy, each under its appropriate head, Chief Engineer, General Manager and Chief Accountant. Each of these chief officers is directly responsible to the Board for the whole of his department throughout the area. In addition, there are certain specialists to advise and assist the three main functional departments. Of course, there is nothing remarkable about the organisation itself, which is fairly typical of other industries and boards, but I do not think

MR. CHESTER: A difficult area to control.

it was a bad effort to achieve this in such a widely scattered area as ours, only five years after vesting date.

Q. Agreed. Now let's go back to the question of plant. How would you describe your approach to the reorganisation of gas production?

C.H.C. Briefly, the policy of the Board was to avoid heavy expenditure on small works and to concentrate all the technical skill at its command on the planning of large new works which, together with certain existing modern plants and those on order at vesting date, would be able to supply the gas required for the whole area in the space of ten years. I am happy to say that this programme is very nearly complete.

Q. This brings us to the subject of integration and, of course, we know that the South Western Board has the longest grid in the country. Just how many works have been closed to date in your integration scheme?

C.H.C. Last year we closed 20 works, bringing the total since vesting date up to 60. Now the total stands at 73. Capital restrictions may slow up the closing phases of the scheme, and we shall probably have to wait a few years before we reach our ultimate goal of 15 major, interlinked works.

Q. Which are they?

C.H.C. Eventually our manufacturing units will comprise, from West to East, Penzance, Truro, Newquay, Bude, Plymouth, Bideford, Torquay, Exeter, Exmouth, Weston-super-Mare, Bristol, Bath, Gloucester, Cheltenham, and Swindon. The grid will then be continuous from Penzance right up to Evesham.

Q. What have been the benefits resulting from this integration?

C.H.C. Well, obviously new works and the development of existing major works have improved our production efficiencies. For example, the average thermal yield before benzole extraction, per ton of coal is now over 75% as compared with 71% in 1945-50, and over the past two years there has been an improvement of about 2% in the yield of gas and about 2% in the production of coke for each ton of coal carbonised. When you consider that in a year the Board carbonises 1½ mill. tons of coal this improved efficiency is equivalent to 30,000 tons of coal and 15,000 tons of coke and breeze—a saving of £300,000.

Q. What has that meant to the consumer?

C.H.C. The combined effect of improved efficiencies and increased productivity has been to save the consumer a minimum of 2d. a therm on all gas sold. We believe that passing on the savings which have arisen from our improved operations is good business—and our new tariffs offer the public further opportunities to benefit from these developments. We must not forget the question of calorific value. It is interesting to note that we were quite early in the field with regard to the standardisation of calorific value. As far back as 1951 the Board planned standardisation of calorific value throughout the whole of the area and by the end of the financial year 1954 standardisation of calorific value of 470 B.Th.U. per cu.ft. of gas had been achieved except for five works. At the present time the whole of the area is standardised at that figure.

Q. We will deal with the tariff question a little later. But before we leave the subject of gas production, can you say something about the present position regarding the major works projects you have in hand?

C.H.C. As you have reported in your columns, the Stapleton Road Works are now nearly complete and work is finished on the 6 mill. cu.ft. capacity all-welded gasholder. At Cheltenham the new gasholder should be working during the year. The reconstruction of the works at Exeter has been completed and rather more than half of the plant is in commission. At Torquay a major reconstruction has been completed, the Newnham Works are now nearly finished, while at Keyham a new coke handling plant has been put into operation. And then, of course, there are the new developments at Gloucester.

Q. We know that the new plant at Gloucester is regarded as a key part of your future production plan. Would you like to comment?

C.H.C. The fact is that our developments and research into the use of all types of oil available from the refineries, together with the integration system, is enabling us to build up, in selected stations, to meet any peak load when it arises, both rapidly and economically. We are installing four new processes at Gloucester which will have a capacity of 6 mill. cu.ft. a day. When fully developed these processes will eliminate to a great extent the production of carburetted water gas, making available larger quantities of coke for sale and providing gas made at the most economical price. At the moment the new Jones plant is in operation, one Hall plant is just going in and another is building, the Koppers-Hasche plant is having a dummy run, and the Gaz Integrale plant is in course of construction.

Q. What exactly is the motive behind the installation of these oil gasification plants?

C.H.C. Quite simply, this work is being developed to make the best use of the quantities and qualities of coal available and also to avoid the need to carbonise coal to meet peak load demands economically, while keeping capital expenditure relatively low. If all goes as we hope it will, these developments may have a profound effect on gas manufacture throughout the whole area and, in conjunction with the integrated system of supply, on the future development of sales and tariff policies. Taking the long-term view this may be the solution to the sulphur problem because in winter when

the consumption is high and traditional plant is overloaded this plant will meet the peak loads without sulphur. We shall have the full octave of seven types of gases and we will be able to play any tune we like. Ultimately there will probably be three peak stations—Gloucester, Bristol, and possibly Plymouth. Our final ideal is to undertake the full development of the remainder of the traditional works in stages.

Q. Now may we turn to the commercial side. What was your attitude towards this at nationalisation?

C.H.C. We tried to consider the gas industry in the South West as a completely new industry. The old industry had held the consumer side as being subservient to gas manufacture; in fact, sales people were regarded as necessary nuisances. We did not see it that way at all. The commercial side of the Board has been considerably enlarged since nationalisation and we have energetically recruited salesmen. In 1954 we completely divorced the commercial side from the manufacturing side. We recognised the fact that if our selling machine was to have the required impetus it was necessary to have the drive from the top. Mr. W. J. Baker, our full-time Board Member, has a particular flair for the commercial side of the Board's work and he directs it with Mr. T. N. Dent, the Area Development Manager. The six divisional managers are now devoting all their time to consumer service. We try to keep everyone all the way down the line in the picture. Since nationalisation we have nearly 54,000 new consumers and have sold an average of one appliance to every consumer.

Q. What about maintenance?

C.H.C. I am pleased to say that we have had a free maintenance service on request operating since nationalisation and although obviously the cost of this service has to be integral in the price, it has paid off in terms of safety and consumer satisfaction.

Q. Is there any shortage of fitters in the South West?

C.H.C. Not really. Outside Bristol and Swindon where the factories attract much of the available manpower, we have plenty of fitters and take a great deal of trouble training them.

Q. What is the position regarding sales of gas for industry?

C.H.C. This side of our business is expanding very nicely, particularly at Plymouth, Bristol, Swindon, Gloucester and Yeovil. For example, the aircraft industry is taking an increasing amount of gas. One of the benefits of our integration scheme and the supply of gas from large production centres to localities formerly lacking mains or served by small works which could not expand, is a considerable increase in the demand for gas for industrial purposes in the more rural parts of the area. Last year we instituted a drive for efficiency in the use of gas-fired industrial equipment and to this end supplemented our existing service by placing the Board's own technical staff at the disposal of consumers for making such tests as were necessary to determine the efficiency of the equipment and, where possible, for recommending improvements. We carried out a lot of work on the development of industrial gas furnaces and the strengthening of this side of the Board's activities was very well received. You may be interested to know that we have installed overhead heaters outside a number of shops over the pavement to provide a comfortable temperature for the public looking into the windows in winter. This development may be extended to cinemas and theatres for the benefit of queues waiting to get in. The commercial side of our business is growing too. We now have two men doing nothing but large-scale kitchen planning and this type of service is paying dividends.

Q. We have heard a good deal about your new tariffs. What are the essential features of them and what do you consider will be their effect?

C.H.C. Prior to the middle of 1955 the Board's tariffs had been unchanged for three years. When rising costs made it necessary to recast tariffs the Board had regard to the principle that charges should broadly reflect the cost of providing the supply and recognised that the application of a sound commercial policy must inevitably result in the elimination of those cases where the supply is afforded on uneconomic terms. The two-part tariff devised gives consumers the cheapest gas in the south of England and the lowest but one rate in the whole country. This tariff is available to any consumer using 400 therms per annum and upwards and enables them to use gas at a running rate of 1s. 3d. a therm. The constant supply tariff (which passes to the consumer the benefits derived by the Board from meeting loads which are constant throughout the year) is available to industrial and commercial users whose consumption is constantly not less than 250 therms a quarter. Now every consumer in the area using over 47 therms a quarter pays less than he did under the previous tariffs and in some parts of the area the savings begin at 40 therms. The new 'running rates' reduce the price of gas in Cornwall by one-third which, you may agree, is not a bad effort. And bear in mind the fact that hundreds of tariffs existing at 1949 have been replaced by practically one common tariff for the whole of the area. We expect great things of our two-part tariff; it has certainly given our competitors something to think about.

Q. Now, Mr. Chester, we come to the question of redundancy. With the very substantial reduction in the number of works and the reorganisation of the same six divisional controls incorporating 13, instead of 24, administrative districts and 43 branches, there has been resulting redundancy of employees in both of the functions of production and general consumer service. The way in which this has developed has, you must admit, brought the Board a certain amount of criticism in the Press. May we have your comments?

C.H.C. First of all I want to make it quite clear that it is the function of a gas board to be efficient, and that means that you cannot afford to have ghosts on the payroll. If it is not efficient, the stability of the industry will be impaired and ultimately personnel will suffer anyway. In other words it is necessary to be realistic, but at the same time the impact of these developments on personnel can be reduced to the absolute minimum. This we have done. Apart from the effects of integration on the supply and distribution side of the Board's activities, one of the developments having greatest effect on employees is the centralised mechanisation programme for accountancy. All accountancy now carried out at 11 centres will be dealt with at Bath—here I might mention that we will have the first electronic accountancy in the county—and inevitably this has resulted in some personnel problems. In dealing with the problems, even hardship, which these programmes inevitably bring to employees, our policy is always directed towards mitigating to the fullest extent possible the impact upon individuals and every effort is being made to ensure continuity of employment within the Board's organisation. There has been a high degree of consultation with the Trade Union representatives on this subject over the past three years and the arrangements

(Concluded on p. 515)

THE W-D CONTINUOUS VERTICAL RETORT

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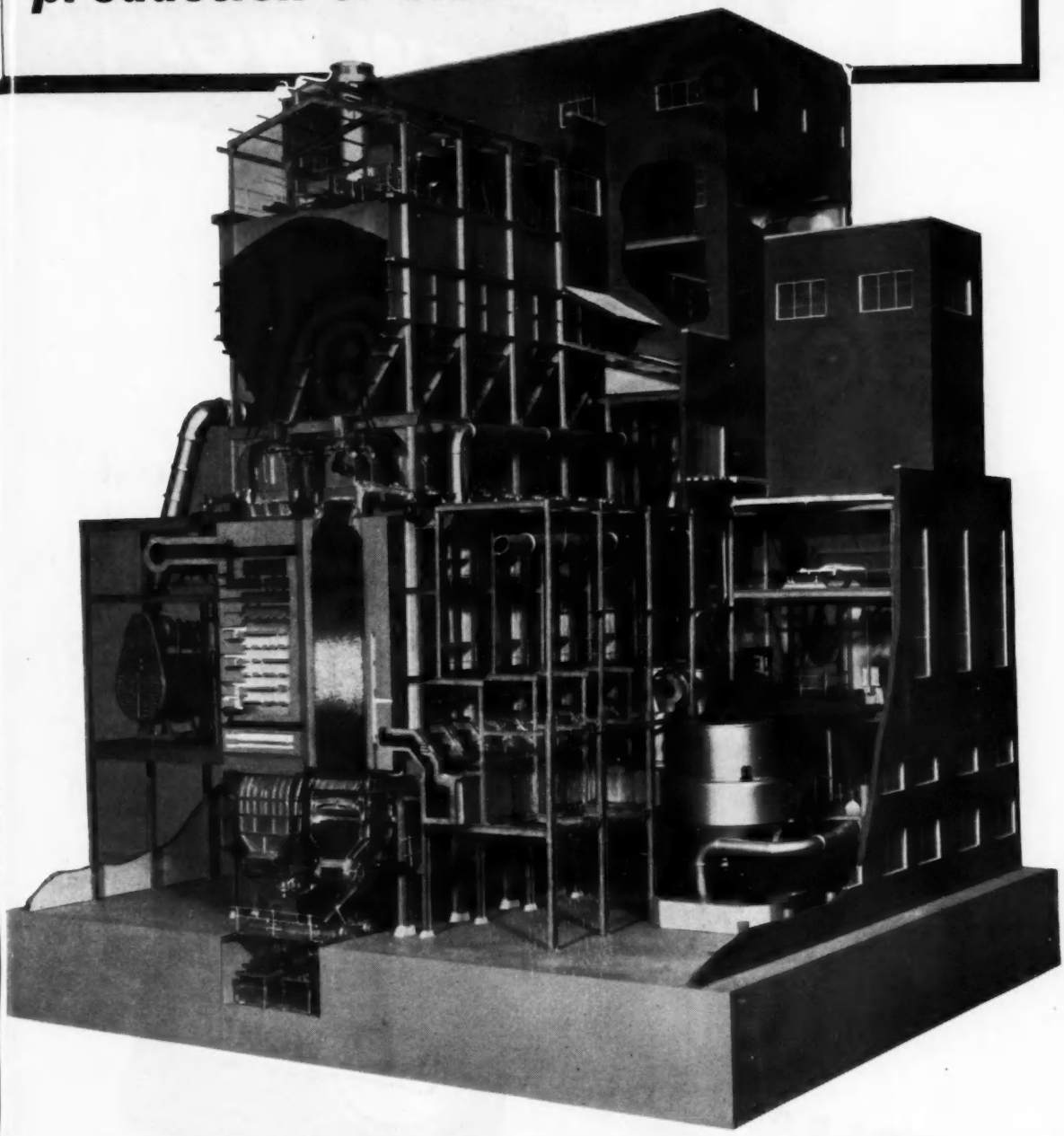

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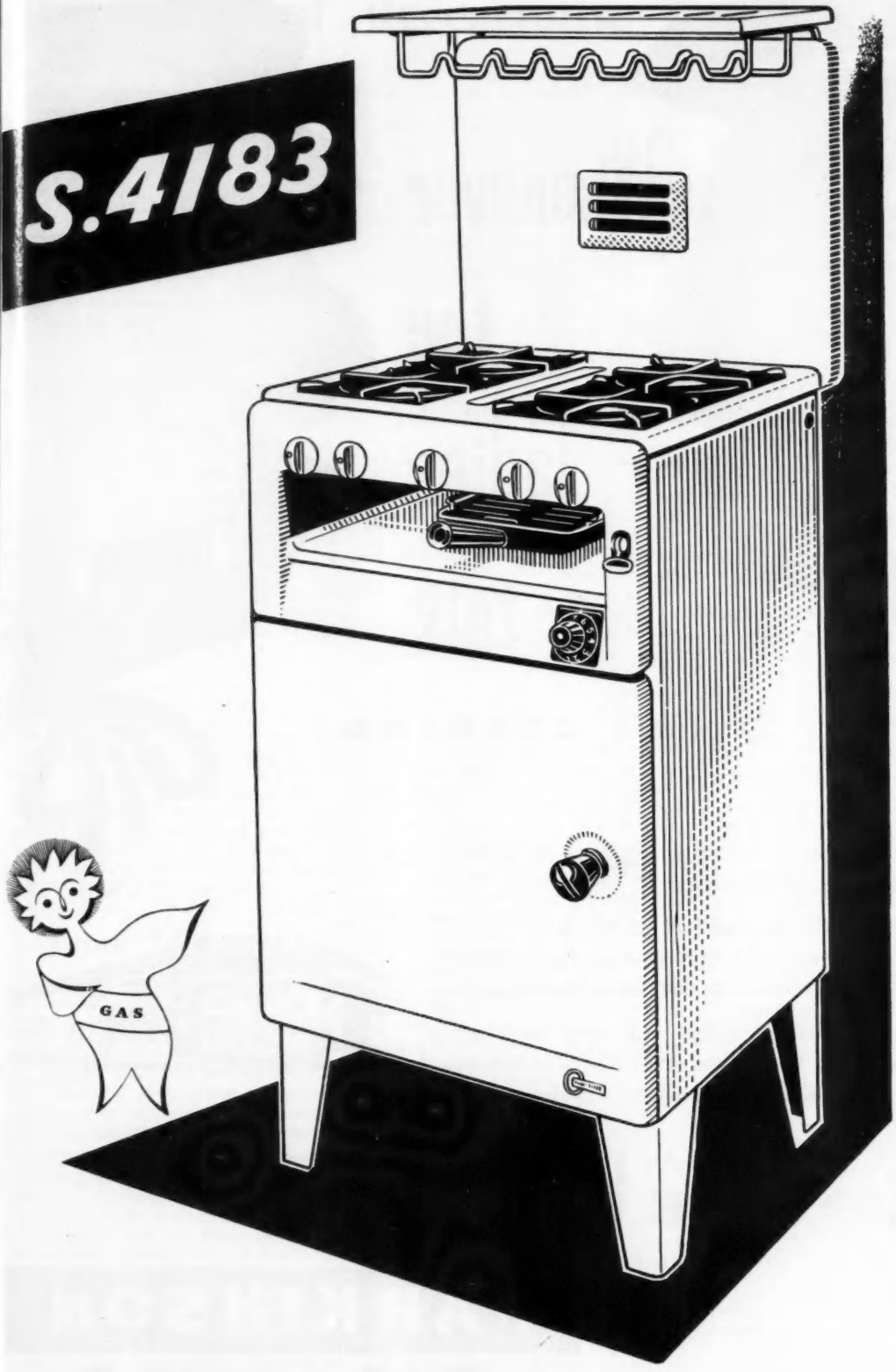

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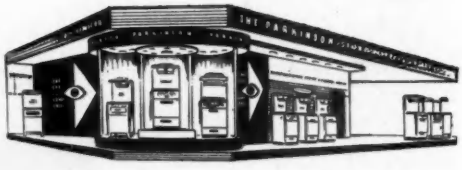

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PARKINSON GAS COOKER

THE PARKINSON STOVE CO. LTD., STECHFORD, BIRMINGHAM, 33.

(A Member of the Parkinson & Cowan Group)

Britain's First Regenerative Onia-Gegi Plant

SATISFACTORY OPERATION IN CARLISLE

May Influence N.G.B. Future Policy

THE Northern Gas Board's Carlisle works has brought into satisfactory operation during the last few weeks the first regenerative type of the Onia-Gegi oil gas process in the country, and results of operation may well determine future plant policy for the Board.

This is the biggest single development in Carlisle since vesting day, and the new plant is being inspected by visitors from other gas boards.

Its production capacity is 1 mill. cu.ft. a day compared with the 4½ mill. cu.ft. a day capacity of the existing orthodox plant, and it will not only act as a standby, states Mr. A. R. Croft, Cumberland Divisional Manager, but will enable the Board to go ahead with a large-scale reconstruction of the vertical retort coal gas plant, originally installed in 1922.

The alternative would have been a water gas plant and Carlisle can already use all the coke it can produce.

The gas generating parts of the new plant are erected in the open with the automatic operator, controlling equipment, and ancillary machinery under cover. The plant uses heavy oil as feedstock instead of coal. The cyclic operation of the valves is by pneumatic cylinders controlled by pilot valves in the automatic operator, the system including full safety interlocks.

One of its great advantages is that it can be brought into operation at short notice. The demand for industrial and commercial gas in particular is constantly on the increase in Carlisle so that the present plant is working to capacity and in a long cold spell might have difficulty coping with much extra demand.

There are about a dozen other oil-gas plants working in this country—Romford has the biggest installation of six sets capable of 40 mill. cu.ft. a day—but this is the first of the regenerative type. The builders are Humphreys and Glasgow Ltd. of London.

MAXIMUM PENALTY

The Scottish Gas Board was fined the maximum penalty of £20 at Kilmarnock Sheriff Court for failing to comply with the Factories Act. The Board admitted that one of the gates in a hoistway at the Saltcoats gasworks was not fitted with efficient interlocking devices to ensure that it could not be opened except when the cage was at the landing and that the cage could not be moved from the landing until the gas was closed.

From Metermen to Salesmen in One Week

FROM metermen to salesmen in one week was the aim of a recent course held in Glasgow by the Scottish Gas Board, when 17 prepayment meter collectors, three first-class gas fitters, and one meter mechanic were given a thorough grounding in gas appliance sales technique.

Specialists from the Board dealt with every aspect of gas servicing, advertising, kitchen planning, and the laws governing the supply and sale of gas.

Three Gas Council films on salesmanship were shown, and Mr. A. L. Jackson, Governing Director of Sales Consultants, Ltd., Leicester, lectured on selling techniques in the showroom and home.

The trainees were entertained to lunch by Mr. G. Jeffs, Northern Area Sales Manager of Ascot Gas Water Heaters, Ltd.

Council for Gas Staffs Writes Letter to Minister of Power

INJUSTICE TO EX-COMPANY STAFFS ALLEGED

THE National Joint Council for Gas Staffs has written a letter to the Minister of Power, Lord Mills, referring to an answer given in the House of Commons by the Paymaster-General to a question by Dame Irene Ward last month intimating that Lord Mills had informed the Central Electricity Authority and the Gas Council that approval would be given to increases analogous to those under the Pensions (Increase) Act 1956, for ex-municipal employees with the necessary qualifications who have retired from the two industries.

It would appear from this, states the letter, that ex-company employees who have retired from the gas industry are to be excluded from the benefits to be accorded to ex-municipal employees who have also retired from the industry, and to other classes of retired public servants who are covered by the provisions of the Pensions (Increase) Act, 1956.

The trades unions concerned consider this a discrimination against the ex-company staffs, the letter continues, particularly as the Gas Council acknowledged the justice of treating all its retired employees similarly, by framing its proposals to cover them all.

What has been done is considered an injustice to ex-company staffs, the letter concludes, and asks that steps be taken to remedy it by approval of the proposal submitted by the Gas Council to cover all retired employees of the gas industry.

IMPERIAL COLLEGE TO GIVE COURSE IN NUCLEAR POWER

A POST-GRADUATE course in nuclear power is to be introduced in October at the Imperial College of Science and Technology, London. This follows the recent establishment at the college of a Chair of nuclear power, to which Dr. J. M. Kay was appointed.

The course will be based on the belief that nuclear power is a new field for the application of existing basic branches of engineering rather than a distinct technology. It will include laboratory work and an introduction to the problems of engineering design in the field of nuclear power.

Showroom Experiment in Wales

AN experiment in co-operation between a nationalised industry and private enterprise has been initiated by the Wales Gas Board when they opened a new showroom at the premises of the South Wales Builders' Supply Co., Ltd., in Newport, Mon.

This showroom, officially opened by Lady Rhys-Williams, last week, provides an opportunity for builders, architects, and prospective house purchasers, to inspect the latest developments in domestic gas appliances and thus places them in a position to plan properly a complete domestic installation.

The 50-ft.-long department is tastefully decorated in pastel shades and the numerous appliances are attractively displayed. It includes a 'live' all-gas kitchen containing refrigerator, drying cabinet, sink water heater, washing machine, and the latest model cooker with eye level grill.

Guests at the opening ceremony were given samples of Welsh cakes, pastry, and soups cooked by four home service advisors dressed in Welsh national costume.

Gas on Show to Scots Local Authorities

HOUSING PROJECT PROVIDES Sc.G.B. WITH OPPORTUNITY

PROVIDING the Scottish Gas Board with an excellent opportunity of demonstrating the uses of gas in small modern homes, representatives of Scottish local authorities are being invited by the Department of Health for Scotland to inspect a new demonstration housing project built by Edinburgh Corporation.

The scheme was officially opened last month by Mr. J. Nixon Browne, Joint Parliamentary Under-Secretary of State for Scotland. More than 90% of the tenants have chosen gas for cooking and home laundry.

The visiting local authority representatives will see five demonstration houses of different types, and in four of those all cooking and heating appliances are gas-fired. In the fifth the Calestro coke grate with the built-in gas rail for ignition has been installed.

In the house designed for one person, the Board have installed a new type of gas cooker, manufactured by Stoves Ltd. Smaller than the normal domestic type cooker, it is equipped with a hotplate with two boiling burners and one grill burner, and a properly designed small oven.

The advantage of this appliance to a person living alone is that it conserves the amount of fuel used against a specific cooking task and fits neatly into a small kitchen. The finish is high grade, easily cleaned, vitreous enamel, and all control taps are safety spring loaded.

Problems involved in heating Heywood Market Hall, Lancs., were overcome this winter by the North Western Gas Board in co-operation with Parkinson & Cowan Industrial Products, Ltd. Altogether 43 of these WM/1X heaters were installed, mounted at a height of 9 ft. 6 in., having been selected in competition with other fuels. Consumptions tests during January and February showed an average usage of 29.25 therms per day, and officials of Heywood Corporation have expressed complete satisfaction.

The home laundry appliance is the 10-gal.-capacity wash boiler, fitted with special safety type flexible tube and plug-in-connector tap. The solid fuel grate in the living room is specially designed to burn gas coke; to facilitate lighting, a built-in gas ignition device is provided. The tap controlling this device is also of the safety pattern.

In the house for two, there is a gas cooker of normal dimensions, it being assumed that more cooking, and possibly more entertaining would be done than in the house for one person. The boiler is as fitted in the single house, and the solid fuel grate also has gas ignition. All appliances are fitted with special safety-type taps, and the whole installation is easily cleaned and compact.

Two of the maisonettes are equipped with gas for cooking. The types of appliance shown are similar to those normally chosen by municipal tenants in Edinburgh.

'NOW GAS GOES TO MARKET'

(Concluded from p. 497)

A subsidiary stand illustrates the way in which Flavel cookers meet the demands of the newly-weds, the growing family or the elderly couple; cookers shown are the 'Imp,' the 'Mercury' and the 'Envoy.'

Cannon (G. A.) Ltd. have an interesting new appliance in the Double de Luxe cooker which is in fact two complete cookers in one. The user has two ovens, two warming drawers and a spacious six burner hotplate at her disposal; a fold-away high-level grill is inset into the splash-back with a built-in floodlight and five-hour cooker timer. The cooker is delivered in two parts which are blended together into a single unit on site. Other Cannon appliances include the A130 cooker and the GasMiser convector fire. (Note to special visitors: This stand has the most novel lounge in the exhibition—a perfect replica of the saloon on a yacht).

Ewart and Son Ltd. have a neatly styled stand which effectively displays their range of instantaneous and storage gas water heaters. Of particular interest is their latest small sink storage water heater.

R. & A. Main Ltd. present the Super Century cooker which might be described as the Century after having been to a *de luxe* finishing school. Features include an eye-level grill, glide-over pan supports, new pattern burners with a pre-set simmering position, almost enclosed grill compartment, and a range of two-colour finishes. Another newcomer is the Century convector heater which, it is claimed, has the highest efficiency of any similar type appliance; a handsome fire it has exceptional heat variation.

Newton Chambers & Co., Ltd., display the well-known Redfyre open coke convector fire, the new Redfyre domestic boiler, and the rest of the Redfyre range.

Parkinson Stove Co., Ltd., on a particularly well-lit and attractively finished stand, show three cookers—the Renown Six, the Renown Five, and the Prefect—on all of which self-lighting hotplate burners, colour variations, and eye-level grills are available. A neat revolving eye gimmick lends weight to the theme 'Eye-level Grilling for All.'

Radiation Group Sales Ltd. show a now familiar range of cookers on their characteristically fine stand—familiar that is with the exception of the Seventy-One T.T. which is now available with a cabinet base as an alternative to the former legs and potrack. Notable among the range of fires are the new Rado-Vecta and Nocturne 505 portable; among the water heaters mention must be made of the Stratalyn and the Speedlyn.

General Gas Appliances Ltd. show what is perhaps the gas appliance of the year—the first fully automatic model. Other features of the Auto-Range include built-in strip light on the hotplate, glide-over hob, and large grill compartment with drop door. Also shown are the Senior and Junior General cookers, Conray and Portans fires, etc.

Other manufacturers familiar to the gas industry include Hurseal Ltd., showing the new Hurdapta III convector fire, Electrolux Ltd., showing the Family refrigerator and others, and Ideal Boilers and Radiators Ltd., showing the Neofire and gas-fired boilers.

Dr. A. G. Glasgow, who died in 1955, after a distinguished career in the gas industry.

Delivered to The Institution of Gas Engineers in London on March 5

The Glasgow Memorial Lecture

By F. M. BIRKS, C.B.E., M.I.C.E., M.I.Mech.E., Hon.M.Inst.Gas E.

DR. ARTHUR GRAHAM GLASGOW was born at Buchanan, Virginia, in May, 1865. He graduated from the Stevens Institute of Technology in 1885 and joined the United Gas Improvement Company of Philadelphia. This concern was unique in any country of the world, since although engaged in the supply and manufacture of gasmaking plant, it controlled and operated some 40 gas undertakings. The young engineer was Secretary and Manager, Lewiston Gas Light Company, 1886, Engineer, Kansas City Gas Light and Coke Company, 1888, and was appointed General Inspector to the United Gas Improvement Corporation, 1890.

Background of Problems

In order to appreciate his life's work, it should be viewed against a background of the problems that beset the industry at that time both in Europe and the United States of America. For nearly 60 years, the industry in this country had been mainly engaged in producing gas for lighting purposes, but, having been without serious rivals during this time, it would be no exaggeration to say that many boards of directors and higher executives of undertakings had become quite complacent regarding problems of supply. When, in about 1878, the practicability became apparent of the supply of electric light to the public, they suddenly began to take their responsibilities very seriously, but found themselves beset by several worries.

The general increased prosperity of the country was reflected in the gas industry by steadily increasing consumptions, which somewhat lessened their anxieties. Nevertheless, the low price of coke and the greater quantities made resulted in difficulties in selling at a time when its smokeless properties did not attract the ordinary individual. The trouble gradually got worse until in the '80's recourse to exporting surplus stock was instituted.

In order to be less dependent on the lighting load, serious encouragement, previously actively discouraged, was given to cooking and heating, etc., by gas, and also to the industrial load. At this time, the cheapest and most convenient form of obtaining small power supplies was by means of gas engines, and the supply of gas for this purpose became quite an important part of the industrial load.

Peak Load Due to Lighting

The peak load was also causing anxiety; this was somewhat unpredictable as it was caused by what today we would call 'smog,' but this was a more virulent type than is experienced nowadays. The peak was not due to the heating load as it is today, but almost entirely to lighting. In summer, the consumption was for about eight hours during the night, and in winter about 16 hours. The holders were filled in the day time to tide over the night consumption. During black fogs, the lighting continued throughout the 24 hours, so it will be appreciated that it constituted a very severe peak, particularly when the fog continued for several days.

It was customary to keep carbonising plant under slow fire for such emergencies, while it was usually considered that the holder capacity should be equal to the output of the maximum day. Even so, in order to tide over such difficult periods, it was not unusual to 'over pull' on the retorts and to drop district pressure.

The problem that was foremost in their minds, however, was the growing difficulty of keeping up the candle power of the gas, due to the growing shortage and high price of cannel coal, whereas in order to compete in the future with the young electrical industry, they all realised that it would be essential, however difficult, still further to improve the brilliance of the luminous gas flame.

The water gas reaction had been well understood for many years. The first record of a practical carburetted water gas process in England was in 1831, when George Lowe patented a process whereby hot coke was discharged from a horizontal coal gas retort direct into a water gas generator and then intermittently heated by natural draught and steamed to form water gas. It is interesting to note that the patent states that the gas should be enriched by saturating with the vapour of essential oil or other illuminating materials. Lowe was at that time the Engineer of both the Curtain Road and Brick Lane works of the Chartered Gas Light and Coke Company, and in the following year was promoted to Chief Engineer, which position he held with great distinction for over 30 years. He was a Fellow of the Royal Society and became eminent in his profession.

None of these early suggestions could materialise into commercial plants until supplies of mineral oil became available for enriching later in the century. The Gas Light and Coke Company, about 1887, installed at its Silvertown works a water gas plant on the Meize system. Although there is evidence that it ran for some time, its performance is hidden under a blanket of silence, and in 1892 authority was given to convert it to the Springer process, but after that the silence still persisted, from which we may conclude it never, in either form, came up to expectation.

Mr. F. M. Birks, C.B.E., who was President of the Institution of Gas Engineers, 1950-51.

In the remainder of Europe, little seems to have been done, but undoubtedly a great deal of thought was given to the matter, as far back as May, 1851. In France, particularly, as well as in the United Kingdom, suggestions were often put forward to lay separate mains for the distribution of blue water gas for heating and industrial purposes.

In the United States of America, conditions were very different, because it was then possible to enrich it economically, as large supplies of mineral oil were being found and were nearly as cheap as coal. In parts, anthracite was freely avail-

able; this coal, being natural coke, was suitable for gasifying, but not for carbonising.

From 1874 onwards, many oil-enriched blue water gas plants had been constructed. These consisted of three broad types:—

(1) Retort processes, namely those in which the carbon for the decomposition of the steam was contained in retorts externally heated.

(2) Generator processes, namely those where the carbon for decomposition of the steam was contained in a refractory-lined vessel, the coke being blown by air until white hot, when steam was subjected to the hot coke. The resultant blue water gas was enriched by passing it into a second vessel heated by a separate fire.

(3) A modification of the second class, in which carburetted water gas was made in a single operation; the gasification and fixing of the gas taking place simultaneously with the manufacture of water gas by means of a superheater filled with refractory checker bricks and heated by the blast from the generator.

Lowe Process

To the last of these belonged the Lowe process invented by Thaddeus Lowe, born in 1832. He must not, however, be confused with George Lowe; they were in fact not related. This plant construction by Lowe in 1874 was the forerunner of the modern carburetted water gas plant and comprised, very simply, a water gas generator and single superheating vessel for oil cracking, a wash box with water seal, a gas scrubber and a condenser. The operating cycle of this plant consisted of a blow phase when the coke in the generator was heated by burning with air. The combustible in the blow gases leaving the generator was burned with secondary air at the bottom of the superheater to heat the refractory checker brick therein, and the waste gases passed to atmosphere through the open stack valve at the top of the superheater. When the coke in the generator was sufficiently hot, the air blast was shut off, the stack valve closed and steam admitted at the bottom of the generator, the resultant blue water gas being withdrawn at the top of the generator, at which point enriching oil was sprayed in and eventually cracked and fixed in the superheater, the carburetted water gas thus formed then passing through the washer seal, scrubber and condenser to the storage gas holder.

At this time, the main outlet for mineral oil was as paraffin for the lamps of China and the rest of the world. The oil used on the water gas plants was either the residue from this distillation, sometimes with the lighter spirits added back, or crude oil. As a gas of 29 to 30 candle power was often called for, necessitating a consumption up to 4½ gal. of oil per 1,000 cu.ft. of gas made, considerable difficulty had been experienced with the earlier Lowe plants due to the deposition of lamp black in the checker brickwork; this caused the plants to cease gas making for long periods, in order to clear the brickwork.

The greatly increased thermal efficiency of the Lowe plants over the earlier ones was, to some extent, nullified by the sooting up trouble.

Dr. Alexander Crombie Humphreys, born in Edinburgh in 1851, the son of a Doctor of Medicine who moved to Boston, U.S.A., in 1859, was brilliant at school, but, having passed the examination for entrance to the Naval Academy, found that he was too young to enter, so went into a business office. At the age of 26, he was married with two children and was the Secretary and Superintendent of the Bayonne and Greenville Gas Light Company. Feeling that he could not give his best on account of lack of technical education, he approached his employers and asked to be allowed to attend the Stevens Institute of Technology, the authorities of which said he might graduate in six years, with an attendance of two days a week. Authority was readily given provided it did not interfere with his work, and he entered the University in 1877 and graduated in only four years with 90% marks, having written a thesis on water gas.

Soon after, he became Chief Engineer of the Pintsch Gas Lighting Company, of New York. During his three years in this position, he carried on much experimental work on the manufacture and use of high-power illuminating gas, with especial reference to lighting trains, ferry boats, buoys, etc. In 1885, he was drafted by the United Gas Improvement Company of Philadelphia as its Chief Engineer.

Special Assignments

On being appointed Chief Engineer, he started at once to recruit technical graduates and one of the first was Glasgow, who was employed as a cadet engineer on special assignments, as an assistant in various gasworks, as Manager and Secretary of Lewiston-Auburn Gas Company, as personal assistant to the General Superintendent, as Engineer of the Kansas City Gas Light and Coke Company, and as General Inspector of manufacture at all the United Gas Improvement Corporation's works in 1890.

In order to attempt to get over the sooting of the brickwork in the superheater, the position of the injection of oil had been placed somewhat up the side of the superheater instead of at

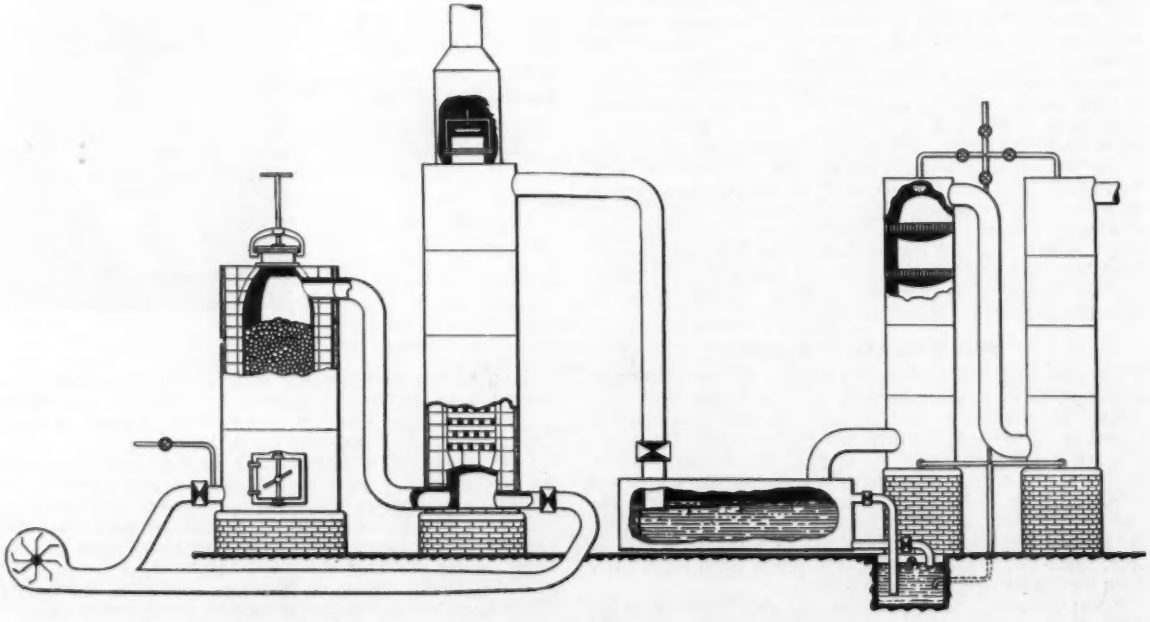
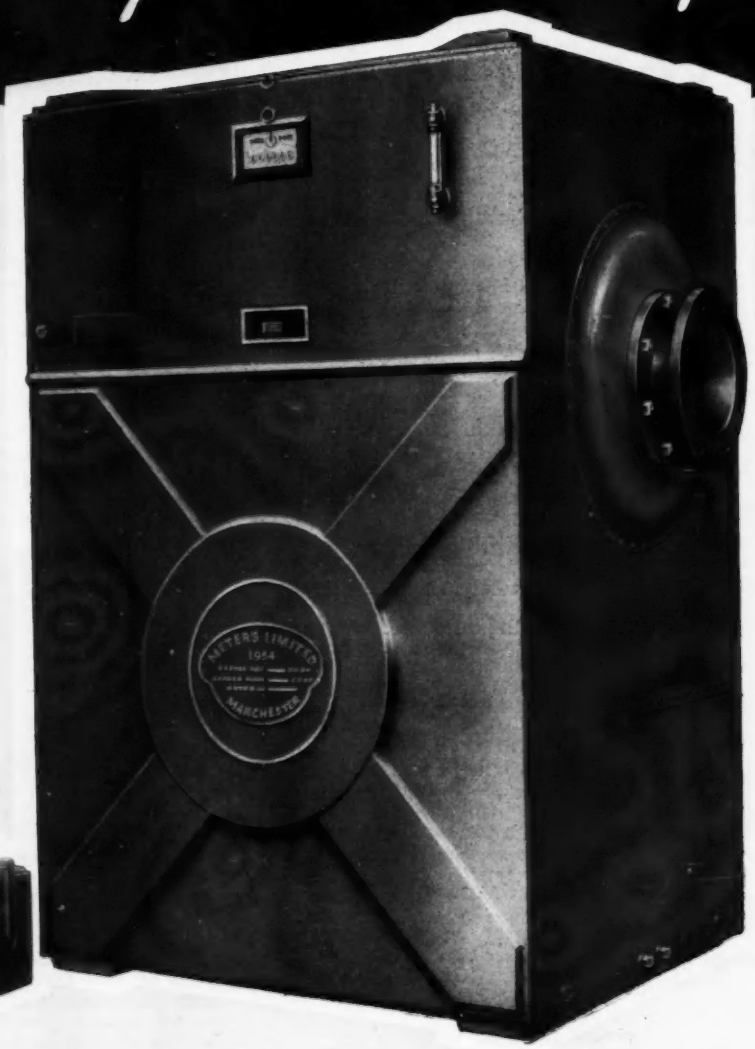


Fig. 1. The Lowe carburetted water gas plant.

DOMESTIC OR INDUSTRIAL... METERS

100 cu.ft/hr to 50,000 cu.ft/hr.



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All Boilers are equipped with a complete set of thermostatic controls, and have insulated jackets of enamelled steel or aluminium in appropriate finishes. 'Ideal' Gas Boilers, of which several thousands a year are being installed, are available in 22 sizes from 20,000 to 1,430,000 B.T.U. per hour. *An illustrated booklet giving full details is available on request.*

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Foremost for heating and sanitary equipment

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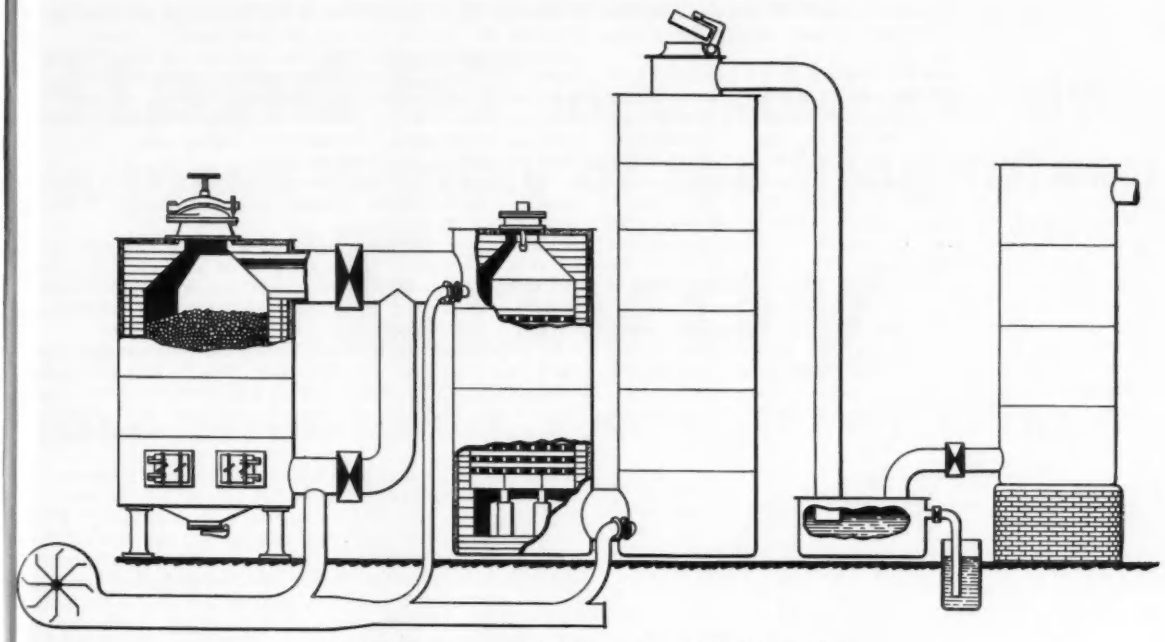

Fig. 2. Humphreys and Glasgow plant at Belfast in 1892.

the top of the generator; this, however, did little to improve conditions.

Fortunately, at this stage the various interests representing the Lowe process were consolidated, absolute control passing into the hands of the United Gas Improvement Company, when, under the general superintendence of Humphreys, engineering skill of a high order was brought to bear on these problems; henceforth the technical and practical side of the process received unremitting scientific attention. In the 40 works of the Company, at some time or another, every known process of making water gas had been in use, so Humphreys had a unique opportunity for quickly obtaining and analysing results.

Double Superheater

He, after a short while, introduced his double superheater system called the improved Lowe system. In this arrangement, the water gas leaving the generator entered the top of the first superheater (afterwards called the carburettor), the oil sprayed downwards at the centre of the top uniformly covered the whole cross-section of the gas stream and, as the gas travelled downwards, the lighter spirits could not flash off faster than the heavier constituents.

A further great advantage to this system was that each vessel could, by adjustment of the secondary air to burn the combustible blow gas, be regulated to the most suitable temperature to ensure perfection of both carburetting and fixing the gas, as each vessel had a separate supply of air.

This was the general overall position in 1889 when the Board of Directors of the Gas Light and Coke Company sent their very able and experienced Chief Engineer, George Carless Trewby, over to the United States in order to ascertain whether American practice could be adapted to conditions in the United Kingdom. The first plant of 1 mill. cu.ft. per day, consisting of two 500,000 cu.ft. per day sets, was ready for shipment in October, 1890, although authority to order this plant had not been granted until August, 1890. Glasgow was charged with the task of getting this plant successfully into operation, and succeeded in getting it to work in the very early days of 1891.

Later in 1890, another plant was ordered from the United Gas Improvement Company, Philadelphia. The 1890 orders to America totalled 2 mill. cu.ft. capacity and were subject to the free licence for the use of patents, if any, in respect of further plants.

The two original plants had been arranged to be fitted with annular oil heaters around the hot gas main outlet from the superheater. In September, 1890, the Gas Light and Coke Company placed orders for 10,000 tons of Novorossisk Russian crude oil and one cargo of American oil.

Russian Oil Unsuitable

The first section of the plant appeared to have started up with no difficulty, but it was soon evident that the Russian oil was unsuitable; the time taken to clear the carburettor and superheater of lamp black reduced the capacity of the plant to about half. With so much stock of this oil on its hands, it must have been very disconcerting to the company, but the solution was rapidly found by a second distillation from which the heavy oils and pitch were discarded. This appears to have constituted what was afterwards known as gas oil, and soon this fraction became freely available, the oil corporations being thankful to find an outlet for what had previously been a drug on the market.

Prior to coming over to this country in 1891, Glasgow had read a paper to the American Gas Lighting Association on 'The practical efficiency of a carburetted water gas setting.' This had so impressed the President that he persuaded him on his return to America to take the position of General Manager and Chief Engineer of the Standard Gas Light Company of New York. After a short while, this proved uncongenial and he therefore left and took up temporary assignments, keeping foreign opportunities in mind. He had not long to wait as he met a Danish Technical Commission at Kansas City to show them the carburetted water gas plant he had erected there. They were sufficiently interested to suggest that he should go to Copenhagen.

Search for Plant Additions

During 1891, the Gas Light and Coke Company was desperately looking for large plant additions and, as it appeared that Humphreys had failed to persuade the United Gas Improvement Company further to extend beyond the United States, for the reason that their chief objective was to acquire existing gasworks and profit by the economies introduced rather than install the Lowe process in gasworks owned by others, the undertaking had to decide how it could obtain further plant manufactured in the United Kingdom.

From the records, it appears that several concerns offered water gas plants to the company at this time. The engineers, however, appeared to have confidence only in the Lowe system and the Directors appeared to have taken the unprecedented step of authorising the Chief Engineer to prepare the necessary

working drawings and to build and take full responsibility for the plants, although they had had so short an experience with the Beckton installation.

Glasgow must have been impressed with the possibilities of carburetted water gas in Europe and on his return to the United States his enthusiasm was undoubtedly shared by Humphreys, who had been thinking on similar lines and so immediately agreed when Glasgow invited him actively to join in a venture abroad. They formed the Humphreys and Glasgow partnership and established an office at 9, Victorial Street, Westminster, on May 12, 1892, with total resources of $750. It was about this time that Humphreys introduced the down run in the United Gas Improvement plants. This only increased the thermal efficiency by the reduction it made in the combustible fuel lost with the ashes; its purpose was to ensure that the bottom of the fuel in the generator was always at such a temperature that ignition was certain. It had been found, particularly with American anthracite, that after long runs the bottom layer of fuel had become sodden with condensed steam to such an extent that ignition was not recovered during the whole of the blow.

The System's Disadvantage

The disadvantage with the system was that it necessitated two large valves in the gas offtakes which were subjected to considerable temperature and, as the plants tended to become larger and larger in size, were heavy and slow in operation.

The young firm met with immediate success; it worked in closest collaboration with the United Gas Improvement Company with which it had a valuable reciprocal agreement whereby all patents, improvements, drawings, working details, etc., reverted to both parties.

Although, as mentioned before, there was considerable and growing competition, it was able to offer the Improved Lowe System and from the very first incorporated the new down run into its plants. On such slender capital assets, it was imperative to sub-contract for the whole of the plant, and to limit activities to design, erection and starting up. Apart from allowing plants to get into action very quickly, it was found so flexible and advantageous that it was never altered.

The first order obtained was for Copenhagen, and the first plant built in the United Kingdom was for the Belfast Gas Company and consisted of two sets each of 750,000 cu.ft. per day capacity. For some reason there was some delay in construction and the first set was not quite complete by December, 1893. Owing to difficulties with coal, the undertaking was faced with having seriously to reduce pressure a few days before Christmas; on being appealed to for help, Glasgow arranged to have the first set put into action as soon as possible, which very quickly put the undertaking in a safe position. The Engineer read a paper to the Institution in June, 1894, and was most enthusiastic regarding the tactical value of such a plant to meet peak consumption. He also emphasised the wide range of gas quality obtainable and the ease and certainty by which it could be controlled.

Up to this point, everywhere the evidence points to the driving force behind the use of carburetted water gas in the United Kingdom being the desire to improve the candle power of the gas.

Attractive Features

The desire to obtain a better artificial light in general was also strong in America; it was at this time quite easily met, as a number of the gas undertakings supplying nothing but carburetted water gas were able to maintain a quality of 30 candle power. This must have appeared very attractive to the British gas industry. Among several other attractive features of the new system of gas making the chief ones were first, ability to increase the candle power; secondly, to regulate the coke market and thus obtain higher prices; and thirdly, to meet the heavy peak consumption during fog.

At this time the incandescent mantle was known, but was not thought to be of any practical use because of the fragility of the mantle; it was, however, steadily improved until in a few years it came into almost universal use, thus eliminating the interest in gas luminosity. Carburetted water gas was, of course, accepted as a means of easy regulation of quality or, as one gas engineer naively expressed it, being of use when the coal gas exhauster man has been too much in earnest.

Within a few years, the use of carburetted water gas to regulate the coke market was adopted on a wide scale. It was not, of course, possible to do this and to have the plant available as for peak purposes, but using it to regulate the coke for sale during the summer months proved effective for many years until the formation of coke-selling organisations improved the quality, the demand and the price of the coke so that the practice was no longer so necessary.

The advantage of flexibility enabling this type of plant to meet heavily fluctuating demands proved in the end to be the most important factor.

These other advantages ensured a steady and very great increase in the use of water gas and the young firm entered a phase of 'expansion.' Improvement was only made in detail and for over 20 years the general design remained substantially the same.

In 1894, Humphreys left the United Gas Improvement Company and opened up the American office of Humphreys and Glasgow, which he operated with distinction until 1902 when he became President of Stevens Institute of Technology. Humphreys and Glasgow became a British limited company in June, 1912.

The first world war gave a powerful impetus to means for improving efficiency in all spheres of activity and the firm now entered a phase of 'thermal efficiency and automation.' From then onwards, the plants which had for so long retained their original features suddenly began to asssume new shapes. In 1916, the first waste-heat boiler was installed, thus the large amount of heat that previously escaped from the stack during the blast was harnessed to produce steam which was so important a part of the process. The economies so effected have been great. From time to time the design of boilers has been improved.

Valves Heavy to Operate

For some years, the capacity of the plants had been growing and on the larger ones the down-run and stack valves were becoming heavy to operate, more particularly as this operation had to be performed accurately against time. On some of the larger sets, an early servo system was applied, the necessary power being provided by an hydraulic system. The operator was thus able to to control all valve movements while seated at a desk. The small levers of the hydraulic servo valves were light to work and were fitted with neat and effective interlocking arrangements so that it was impossible for the operator to make an incorrect movement of the main valves. This arrangement opened the way to automatic working and in 1919 the first plant in which the various valves were operated automatically was installed at Brighton.

The introduction of this gear enabled big improvements to be made as the operators are not only relieved of the laborious work in operating the valves, but the timing is much more accurate than it is possible continuously to expect from manual working. In 1922, self-clinkering grates were introduced; these are of two types, the dry and the wet. The advantage of the

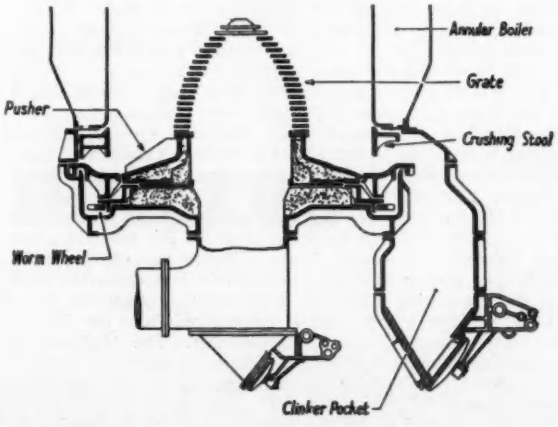

Fig. 3. Dry sealed, self-clinkering generator.

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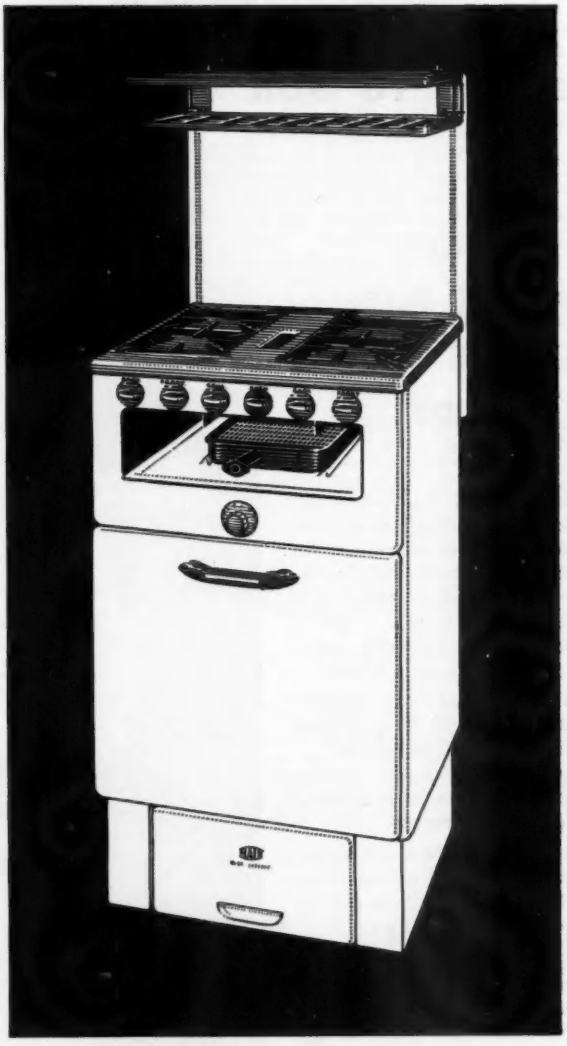

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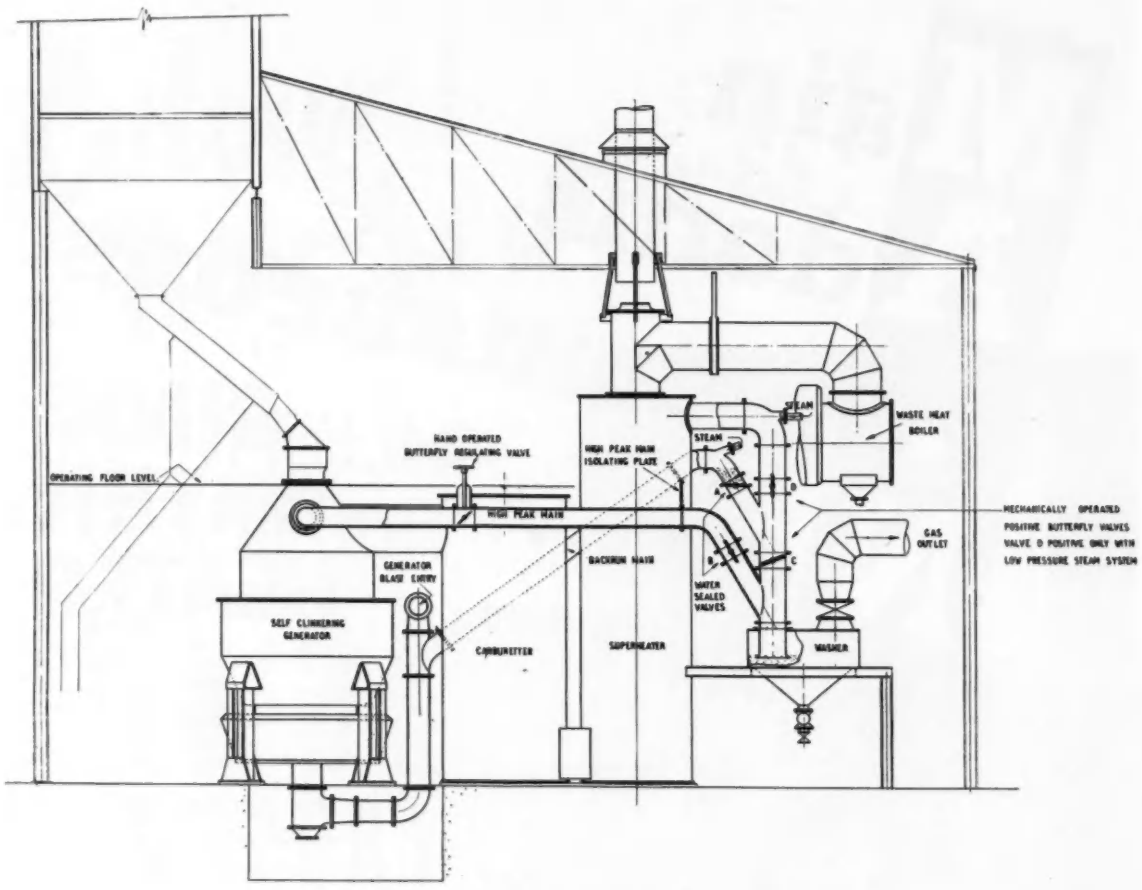

Fig. 4. Diagram of the High Peak process plant.

former is that it allows much heavier pressures to be used on the blast than the latter and thus increases the capacity of the plant, or allows it to work at high capacity with the smaller sizes of coke.

There is a tendency for any clinker forming to stick to the sides of refractory-lined generators, so the bottom section of the generator is provided with an annular boiler solely with the purpose of keeping it so cool that clinker cannot stick. This boiler is not, however, a waste-heat boiler, as it extracts heat from the generator and thereby increases the fuel consumption.

The wet grate incorporates a continuous ash discharge through a water seal. The grate is mounted eccentrically on a base plate which is arranged to be revolved by power at varying speeds to meet requirements. The eccentric rotation of the grate tends to crush any clinker formed in the ash zone, and allows the ash to fall into the outer annulus, where a static plough forces the ashes over the lip of the pan. The inner water seal holds back the pressure of the blast, while the outer seal holds back the pressure in the generator during the blow period. The dry-seal self-clinkering generator is shown in Fig. 3. This type of grate rotates in a similar manner to the wet-sealed grate. A special steel crushing stool is provided; the blast pressure is contained by means of sliding metal joints and the grate is mounted and revolves concentrically. The ashes are pushed into a side pocket which has to be discharged at intervals. A year later, the charging of the generator was made automatic.

The arrangement consists of the usual double system of valves power-operated, which feed on to the fuel bed each cycle sufficient fuel for a cycle. The charge is varied as required at the chute leading from the storage bunkers to the charger. Apart from eliminating the interruptions of the process while fuel is being periodically charged, the small measured quantity delivered each cycle maintains the depth of the fuel bed substantially constant and in a condition for the most efficient gas production.

The introduction of these mechanised operations resulted in an almost complete reduction in the time previously lost in carrying them out and thus makes the process as near as possible to a continuous one.

In 1942, a considerable improvement to the cycle was introduced: The down run which had been in use for so many years was abandoned and a back run substituted. This enabled the large hot gas valves, previously referred to, to be eliminated, as the blue water gas made when the run is downwards is led direct to the water seal and by-passes the carburettor and superheater. This means that during this part of the cycle—some 25%—the gas is not carburetted, so that the injection of oil in the up-run part of the cycle has to be correspondingly increased.

The economy obtained is due to the steam being introduced—while the run is downward—not at the top of the generator, but at the top of the superheater; during its passage through the hot refractories, it transfers a great deal of the heat stored therein back into the fuel bed. This downward run every cycle keeps the fuel bed in a better average condition than the old down run, which was only used every three or more cycles.

It must be appreciated that when the down run was introduced by Humphreys the superheaters were dealing with twice the quantity of oil that is in use today in this country. The heat returned back to the generator with the modern cycle is at the expense of the steam raised in the boiler. It has to be borne in mind, however, that the fuel in the generator is costly coke, whereas dry deficiency of steam is made up from boilers using low-grade breeze as fuel.

The latest development is the High Peak process whereby increases up to 40% of the rated output can be obtained to meet exceptional demands. During the blow, blast gas is

by-passed direct from the top of the generator to the water seal and into the gas mains. A special combined oil sprayer and burner replaces the normal oil sprayer in the carburettor top. As the combustible blast gas is no longer available to be burnt in the carburettor, it is necessary to burn oil in order to replace the heat requirements of the checker brickwork. During the run, the oil input has to be considerably increased in order to bring the low calorific value of the blast gas so used up to the required calorific value of the rest of the make. (Fig. 4.) It may be of interest to give the history of the first two plants installed in this country. Beckton, because of many factors, is a natural site to make water gas. It was remodelled and extended by Humphreys and Glasgow in 1899, and from then on, until the second world war, was rebuilt, the capacity of the units increased, and every improvement added as available, almost continuously.

After hostilities ceased, an entirely new plant was built which embodied every refinement possible to ensure maximum economy in working. Any one single generator has an output greater than all the 10 combined that were installed up to the year 1891. In 1930, a Doctor of Science degree was awarded to Dr. Glasgow by the Washington and Lee University. It has been said that he revolutionised the gas industry in the Eastern Hemisphere, his professional attainments were of the highest order, the staff of his concern were inspired by him to take the most meticulous care in details, and the whole success of the business can be attributed to the confidence he inspired in clients all over Europe.

Contributions to Gas Technology

He was Chairman of the United States delegation to the World's Gas Congress in Paris in 1900, represented the American Gas Industry at the Paris Conference for Standardising Threads, in 1908, and was Vice-Chairman to the Red Cross Mission to Rumania in 1917. He was with the United States War Department in Washington, in France and in England in 1918; with the Fixed-Nitrogen Administration, United States War Department, in 1919, and established on its behalf the Fixed Nitrogen laboratory now administered by the Department of Agriculture.

He had many patents and other contributions to gas technology. He was a member of the Institutions of Civil and of Mechanical Engineers in both the United Kingdom and the United Staes of America; a member of the American Association of Gas Engineers and an Honorary Member of The Institution of Gas Engineers. He was a gold medallist of the American Gas Association in 1910, and of the Franklin Institute in 1928.

He moved to Palm Beach, Florida, at the age of 74, and continued to take a great interest in the concern that he founded until his death at the advanced age of 90 in 1955.

New British Standard for Testing Air Filters Used in Ventilation

PREPARED under the authority of B.S.I.'s Mechanical Engineering Industry Standards Committee, a new British Standard, B.S. 2831:1957, applies to methods of testing air filters used in air conditioning and general ventilation. It does not specify standards of performance.

Section Two of the standard relates to the 'Methylene blue efficiency test.' The methylene blue dust used contains only fine particles. Because of this, the test is a severe one and a filter exposed to normal atmospheric impurities would be expected to show higher efficiencies than those indicated by the test results. Nevertheless, the test provides a fair comparison of the relative efficiencies of different filters when used under similar atmospheric conditions.

Section Three deals with a test for 'Dust-holding capacity and gravimetric efficiency.' The foreword to the standard points out that atmospheric pollution differs from the standard methylene blue dust cloud in that it may contain some coarse particles in addition to the fine ones; this small proportion of larger particles is believed to be mainly responsible for the clogging of a filter, with consequent increase of resistance and termination of its useful life. It is because the life of a filter may be as important as its efficiency that the methylene blue test is supplemented by a test for dust-holding capacity which employs two grades of coarse dust.

(CONCLUDED FROM P. 500)

Metamorphosis in the South West

made by the Board (which have been on an individual basis) to deal with such problems are most fair. In fact I do not know of one case in which the Gas Board has not done the right thing. (Incidentally, many employees as a result of reorganisation have had promotion, with a corresponding salary increase, since vesting day).

Q. Could you give some idea of the numbers involved?

C.H.C. We have had over 200 cases of compulsory transfer of staffs, and you will appreciate that the mobility factor is of paramount importance. Of the 600 accountancy employees, 300 will gradually over a period of 12/24 months be dispensed with, but I would emphasise that many of these were engaged on the understanding that their employment was of a temporary nature. So far not more than ten senior officers have been affected and another ten have been redeployed in non-officer positions. A total of about 135 general staff have been affected; of these 90 have been redeployed and 45 have left or been pensioned. From top to bottom of the Board's employees every one has been given the maximum consideration and help. I would also like to stress the fact that negotiations with the Trade Union representatives have been effectively and harmoniously carried out with real co-operation from both the full-time and lay members of the organisations concerned. There have also been informal meetings on various problems which have arisen and these contacts have contributed in no small measure to the good feeling which exists.

Q. What about training and welfare?

C.H.C. There has been a big development in this field and the Board's activities have been extended, not only in respect of the numbers participating in courses, but by the arrangement of additional residential courses for sales staff and the provision of technical college instruction through sandwich courses for technical trainees. Also we hope to improve training facilities for gas fitting apprentices and to extend, where practicable, sandwich course training. Courses are also to be set down for supervisory training. On the welfare side the medical services of the Board have made considerable progress and the appointment of a Chief Medical Officer has been proved to be fully justified. We have also instituted a staff pension scheme.

Q. From all this one gets the impression of a board which really knows which way it is going. Would you like to sum up?

C.H.C. When you consider that in less than eight years we have provided every one of our increased number of consumers with the cheapest gas in the south (despite the dearest coal), a first-class service, and because of our diminishing dependence on coal and almost complete gas grid, a more flexible and therefore potentially inexpensive and more reliable supply, I do not think we have done so badly. It would be futile to pretend that we have not received adverse comment, much of it ill-informed or politically prejudiced, but I do not believe you can ever make great changes, even for people's own good, without criticism. We believe we are doing a good job and I think time will prove that we are right.

From a paper to the Northern Junior Gas Association, at Newcastle on February 7

Things Mechanical

By H. WAITON, Assoc.M.Inst.Gas E.

IT has been suggested that the number of fitters for a gasworks should be one to two per mill. cu.ft. of gas made per day. At Howdon works, which has a capacity of 17 mill. cu.ft. per day, there are 15 fitters employed with one semi-skilled man, one smith, one oxy-acetylene burner, one welder, one plumber, and one pipefitter. For maintenance purposes the works is divided into nine sections, some of which contain several items of plant and differ in size according to location and requirements. On a rota system, each fitter works four weeks in each section and, in addition, one week on night shift to cover the whole works from 9 p.m. to 6 a.m. This accounts for ten men, and leaves five men in the shop for bench work, special jobs, replacements in the sections due to absence, or the reinforcement of any section temporarily requiring extra labour. The only exception to this arrangement is the water gas plant where, since the installation of the second set, a fitter has been specially trained for the special work involved in maintaining fully-automatic sets and he stays there permanently.

Preventive Maintenance

It is doubtful whether complete preventive or planned maintenance in a gasworks is possible, but it should be at least the goal of every engineer, and at first sight it might appear that here was the finest opportunity ever offered of making planned maintenance a reality. It would be a bold man, however, who would assess at the outset the maintenance personnel required for a completely new works and to start at once on a programme of renewals, but in the past five years the need to counteract increases in operating costs has made it imperative to get the maximum life and service from every item of plant. And so, in spite of difficulties a system has been evolved which, if not the ideal conception of preventive maintenance, does go a long way towards it.

The modern rubber-covered conveyor belts, such as those installed at Howdon, are made up of three principal parts, the duck or fabric, the rubber bond and the rubber covering.

The duck, which is the belt proper, with the other two parts as a means of binding the fabric and protecting it, consists of longitudinal or warp threads and transverse or weft threads of cotton which form, as it were, the muscles and sinews of the belt. These transmit the power developed by the drive and give the belt body, and yet allow the necessary flexibility for the belt to trough to the shape of the carrying idlers. The degree of flexibility is of prime importance since, if a belt is too stiff it does not trough sufficiently to touch the middle idler to run straight, and if it is too flexible it sags so that the load has to be lifted over every set of idlers and power is needlessly consumed. The rubber bond, as its name implies, bonds and unites the plies of the belt to the rubber covering to form a homogeneous structure and, contrary to popular opinion, the main function of this rubber covering is to protect the fabric and not to carry the commodity. Although the cover on the loaded surface is usually thicker than that on the underside, to allow for wear, its thickness and resistance to wear should be such that it will last as long as the fabric it protects.

The condition of a belt cannot with certainty be judged by the appearance or wear of its rubber covering because it may be rotting from within, since injurious elements may have penetrated the duck from chafed or torn edges, and for this reason it is important to align and adjust belts so that the edges are not allowed to rub on any static part of the structure. One of the commonest causes of untrue running is unequal loading, caused by the excess weight on one side of the belt making it climb the trough idlers on the opposite side and foul the supports. To overcome this the loading must be corrected and no unequal adjustment of tensioning screws should ever be attempted. Head and tail rollers should always be square with the belt.

Over a period of 4½ years, two wharf belts and four main coke belts have been replaced. The wharf belts are more vulnerable to damage from the human element and cannot fairly be judged purely on the weight of coke carried, but in view of the more severe conditions under which they work, their performance is considered satisfactory. The four main coke belts carried 584,500 tons, 556,200 tons, 505,300 tons and an estimated 600,000 tons respectively. All these main belts are 30 in. wide with a top cover of $\frac{3}{16}$ in. and bottom cover of $\frac{1}{16}$ in. rubber over four or five ply duck. No belt fasteners are used, except for temporary repairs, since the ends of all belts are vulcanised together to form an almost invisible joint. By eliminating metal fasteners, a vulcanised splice ultimately saves considerable expense by enabling the joint to remain intact for many years, which avoids regular inspections and replacements. The removal of fasteners inevitably damages the belt ends and allows moisture to enter and cause the deterioration of the fabric.

To make the splice, the cut ends of the belt must be perfectly square and, working from a datum line at each end, the rubber cover and the fabric plies are stepped back progressively through the thickness of the belt so that the two ends can be placed together to form a stepped joint which is finally vulcanised. The steps in the cover and plies are arranged on the bias at an angle of approximately 45°. This work must clearly be done by skilled, fully trained, men.

With the cost of the longer belts at £800 to £1,000 each, it is most important to check any local damage which might occur before deterioration starts. Small complete kits of tools and patching materials, therefore, are available for rebuilding chafed edges or small areas where the rubber cover has been damaged. A new belt can usually be pulled into position by the old one, by fastening the loose end of the new roll to the old belt and slowly turning the conveyor drive and in this way the new belt is unwound and threaded through the idlers. When this is complete, the old belt is cut out in sections small enough to handle.

Continuity of Schedule

The coke conveyors at Howdon are of great importance because, since they are not duplicated they form the life line of the works. Those serving the coke wharves may only be idle for six hours before trimming of the coke becomes necessary to maintain the chamber discharging schedule and trimming can only keep the schedule going for another three hours. Any prolonged stoppage of the main belts may affect production on all benches but from there onwards by running coke to the stockyard or the grading plant continuity of the schedule can be ensured. In the grading plant the screens and conveyors form a single line and are interdependent, so that coke cannot flow if any one item is stopped. Such limitations cause a crowding of much maintenance into the periods between the two shifts each day when the coke plant is working.

On the outlet side of the grading plant, a single line of conveyors supplies graded coke to the producer and C.W.G. plants. Maintenance of these conveyors is easier because they are only worked eight hours a day and in the event of a prolonged stoppage the stocks of coke held in the plant bunkers can be drawn upon. Wear and tear on these outlet conveyors is much lighter than on the rest because of the lighter load and the drier and cleaner nature of the coke carried. In general, the conditions under which coke conveyors work are much more severe than those of coal conveyors.

Coke fires are insidious in their penetration and destruction of moving parts while the moisture associated with damp coke and breeze is very corrosive. Unfortunately, we are obliged to keep the belts immediately below the coke wharves wet enough to ensure that there is no possibility of burning should small pieces of hot coke escape through the finger gates when a charge is being tipped. This water is passed on from belt to belt and causes fines to adhere to the belts, the gritty particles from which are carried over the head rollers to cause wear and corrosion of the return idlers. A fortune awaits the man who invents a belt scraper which will successfully remove these coke fines. The original scrapers were the spring loaded type, but they were only effective for a short time since they succumbed to the attack of corrosion—everything becoming quite rigid. The first attempt to solve the problem was by means of a revolving brush driven from the conveyor itself, since it was thought that the fairly high speed of the brush would sweep away the particles but, in actual fact, the brush soon became clogged with breeze. A roller with raised ribs of ¼ in. square bar welded to it in the form of a spiral has also been tried but this, too, was ineffective, since it could not be geared and driven against the direction of travel of the belt because of the danger of damaging the belt and of the power it would consume. But, as is often the case, the best results have been obtained with the simplest method, and that suggested by a workman. It consists essentially of a rubber scraping strip held against the belt by means of a weighted lever. The advantages are the simplicity of loading and the longer life by having a reversible scraping element. The device cannot be fitted to all belts because of their differing construction but it has been adopted where possible.

Prevention of Spillage

A problem common to conveyors is the prevention of spillage and damage at the points of loading, and especially to those handling coke, where the problem can assume serious proportions. Side plates, the function of which is to prevent spillage and ensure central loading, cannot be made to ride on the belt because of the scoring which would result. The space between the side plates and the belt, however, must be sealed to prevent pieces of coke becoming wedged there, so the sealing material used is strip rubber or strips of old belt when available. At first these strips were attached by clamping them against the side plate with a light steel bar with the bolt heads innermost, but there was the constant danger that the bolt heads would wear off and allow the bar to drop at one end. This would act as a plough and cut a 3 in. or 4 in. strip from the edge of the belt. Here again a better method was suggested by a workman and consists in welding the fastening bolts to the outside of the side plates so that they do not come into contact with the coke, and instead of the clamping bar, to use small pieces of ¼ in. plate. Because the bolts are now rigid it is an easy matter to slacken the nuts holding the clamping plates and allow the adjustment of a worn rubber skirt by lowering and resetting it in contact with the belt. The nuts are then tightened with the rubber in its new position.

Side plates usually have a great deal of attention paid to them by the factory inspectors, and their recommendation is that all rollers or idlers which are situated under fixed side plates should be guarded to prevent damage to hands etc. which might be pulled in by the roller and crushed against the lower edge of the plate.

On an installation as big as that at Howdon, which contains 30 conveyors and many hundreds of idlers, experiments involving changes need be slow and part of a long term plan because of the high cost of materials. No parts can be modified or renewed until they have given all the service for which they are capable and so there are several types of idlers in use at the present time which is the result of trials and attempts to find the most suitable for any particular situation.

The principal objection to the original trough idlers is their open ends, which form convenient recesses for gathering water and dust to the detriment of the ball races. Where conditions are favourable, the life of this type of idler is quite satisfactory but where there is water, as in the vicinity of the coke wharves, it has been found advisable to change to totally-enclosed rollers. In similar wet conditions the pressed steel bases of the idler assemblies suffer from heavy corrosion and it is now the practice to shot blast and metal spray these bases when the rollers are taken out for repair or replacement. The cost of metal spraying one base is 10s., a sum well spent when it is realised that painting is in most cases a waste of time.

On the coke conveyors to the far end of the grading plant return idlers are subject to heavy wear from the fine breeze carried on the surface of the belt. Great vigilance is needed to detect when a roller has ceased to turn, for very soon the lagging will be rubbed away at the point of contact and be quickly followed by damage to the roller itself. For this reason a long term policy of their replacement by disc idlers has been embarked upon, since there are several advantages claimed for this type of disc idler:

(a) The rollers on which the rubber discs are mounted are totally enclosed and revolve on a fixed spindle which has flats at each end fitting easily into slotted brackets which makes replacement quick and simple, (b) the hard rubber discs need only be pushed on to the roller when replacements are required. (c) the amount of wear on the discs is seldom uniform so that the belt, as it passes a series of rollers, is given an undulating motion which causes some of the breeze to fall off.

The initial cost of the old and the disc types are roughly the same at £4 10s. 0d. and the replacement discs, with a life of from eight to 18 months depending on their location, cost 5s. 1d. each.

Head, tail, snub and tensioning rollers have undergone trials and experiments, but here again, no formula for the expectation of life has been found because of the widely differing conditions. As might be expected those rollers making contact with the carrying surface of coke belts wear much more quickly than those on the inside of the belts and it is most noticeable that the majority of coal belt rollers are little worse than new except for the tension rollers over which the loading surface of the belts pass.

Most of the large heavy rollers are in very inaccessible positions and many of them are a considerable height from the ground which makes their replacement a major operation and sometimes requires the conveyor to be stopped for as long as eight hours. It is therefore important that they should be removed as infrequently as possible and it has been found expedient to re-cover such rollers from which the original rubber lagging has worn, with unvulcanised cloth without removing them. One disadvantage of the unvulcanised lagging is that water causes it to work loose, so that it is more suitable for use in dry conditions.

Where large rollers are reasonably easy to change, several methods of lagging have been tried with varying degrees of success. One was to cover a roller with strip rubber about 2½ in. wide and ¾ in. thick by winding it on in a continuous length, the edges touching, over a special solution which was applied to the surface of the roller. Under favourable conditions such a roller lasted nearly two years before needing attention but another only lasted a few months before fine breeze had penetrated the joints and forced the rubber off. In order to reduce the number of joints, a full width sheet of ¼ in. rubber was tried next, and jointed in the shape of an obtuse V. The holding solution was again used but the edges were fastened down with set screws. This lagging was in contact with the loading side of a damp coke belt under rather severe conditions but it lasted 1½ years at a total cost of covering of about 150s.

Where running conditions are not severe, the cheapest way is by means of strips from old belts which are glued in the same way, the ends being secured by set screws at a total cost of lagging of about 50s. From experience gained from these various trials the method now favoured is a compromise between all. Instead of the spaced strips, five wider strips are placed close together to cover the whole roller.

Screening Plant

It is true to say that the Howdon coke grading plant has had a more profound affect on the coke marketing side of the Division's activities than its gas production has had on gas sales. It has set a pattern which must be followed or even improved upon, if the industry is to hold its place in the field of competitive fuel and the visitors which have come to see it have far outnumbered those to any other section of the works.

The plant consists of five Pegson units linked by conveyors and housed in a reinforced concrete building, with nine bunkers having a total capacity of 1,000 tons of coke ranging in size

from above 3½ in. to below ⅛ in. Provision is made for reclaiming coke from stock via a skip hoist which discharges into a hopper fitted with a Lockers vibratory feeder at its outlet to feed the coke to the scalping screen. Here it joins coke from the current make. All coke over 3½ in. may be stored or cut by a Cort cutter.

Although repairs and maintenance began in a rather leisurely manner in the rest of the works, with the accent being on maintenance rather than repairs, and gained momentum with increasing age, the heavy calls of the grading plant were felt immediately, and it was soon realised that an improvement in materials and repair technique must be found.

Cast Iron Lining Plates

For chutes as for conveyors, the mild steel lining must be replaced by cast iron. When a chute lining is converted to cast iron, a drawing is first made and given identifying letters and a copy is sent to the suppliers. If the chute is small enough the lining is cast in one piece with its letters on the casting, but if it is large enough to need a lining made up of several sections, each differently shaped piece is given a number as well as its letter. Naturally as many equal sections as possible are made throughout the plant so that there is a large majority of standard rectangular sections which are suitable for many chutes and of which a good stock is kept. The more irregular shapes, however, which usually fit into edges and corners where wear is least, need only very small stocks of them being kept.

In places where the bottoms of the chutes themselves have needed renewing, the worn steel plate has been discarded completely and the new cast iron plates fitted to angle sections welded to the structure. Apart from the easier access for renewal this has a further advantage in that the numbers on the plates can be seen from below and the plant attendants can report that, for example, an L.P.2 is worn through without having to refer to the drawings.

The problem of screens has proved very much more formidable and at the moment it remains unsolved. There appears to be no happy medium between the continual renewal of reasonably cheap mesh mats on the one hand or the payment of astronomical prices for the more durable high grade metals on the other. A recent experiment does, however, give grounds for hoping that at least a part solution is in sight. An ordinary mat of 2½ in. mesh, measuring 5 ft. by 3 ft., was given a deposit of chromium to a thickness of .020 in. The mat was placed at the top end of the 2½ in. screen where it would receive the impact of the whole of the coke both from the current make and that reclaimed. In this particular spot the average life of a mat is 16 days or 6,500 tons of coke. The new mat worked continuously for 76 days when it was noticed that several of the welds between its bars had broken. It was removed and re-welded, but unavoidably the chromium cover the vicinity of the new welds was destroyed and the welding itself could not be protected. Nevertheless, the mat lasted a further 67 days without attention, with a total life of 143 working days, during which it had handled 73,000 tons of coke. It failed eventually by wearing through at the welds. The cost of treatment was £42 10s. and the cost of the mesh itself £2. Taking into consideration the number of mats saved and the cost of all the time and materials which would otherwise have been expended the chromed mat proved the dearer by a few shillings. On the credit side was the labour made available for other work and the increased availability of the screen. The chromium covering not affected by re-welding was not appreciably worn, which led us to believe that .020 in. was unnecessary. In the light of the results obtained, the mat suppliers were asked to make up a special batch of twelve mats with heavier welding. They were unable to do this in the normal process, but they did agree to examine thoroughly our order before despatching to ensure that they were sound. The plating firm agreed to chrome these mats to a thickness of .010 in. for £20 each or less than half the original price. Several of these mats were sent to other works, but I have not yet heard how far they were successful.

With more mats to try, it was possible to place them in various positions in two screens, but the results were disappointing, since the average life was just a little more than four times that of the untreated mats—and this only after some reinforcement by welding where the chromium had worn off. As in the first instance, the bars were eventually worn through at the points of intersection while the chromium covering between remained sound. Being satisfied with the original welding the explanation appeared to lie either in the failure of the deposit to penetrate the crevices at the intersections or in some effect on the steel of welding during manufacture of the mats. Consultation with manufacturers and the firm who carried out the chromium plating led to the belief that the former was the case. However, as a final trial, it was decided to eliminate both possibilities by having ⅜ in. rods treated separately and made up into a mesh mat without welding at the intersections. The requisite number of bright steel rods were bought, chromium plated to .010 in. and welded by the extreme ends only into a normal frame, the welds being away from contact with the coke. It was, of course, necessary to use extra clamping bars to hold the rods rigid against vibration. The rods cost 30s., chromium plating £24 and fitting £4, the total of £29 10s. being £26 more than the cost of supplying and fitting an ordinary weldmesh mat. Some time must yet elapse before comparable results are available. One further trial in the form of a vitreous enamelled mat was most disappointing. The treatment alone cost £7 10s., but the mat lasted only a few days longer than the normal weldmesh mat costing £2.

Hardfacing

There are several places where heavy wear takes place in which it is either not possible or not practicable to use cast iron, *e.g.*—on bolt heads, exposed edges of angles and change-over doors in conveyor heads. In such situations it is the practice to deposit a few runs with Stellite welding rods. This method has proved very successful in the mechanical producer plant where coke grates and wearing plates of the auxiliary hoppers have a short life if not protected. The inlet coke valves, which were always the first parts of the producers to wear, have, after building up with Stellite and grinding, proved capable of lasting the full term between overhauls. It is encouraging to record that the number of working weeks between overhauls continues to increase and that the last unit laid off had worked continuously for 23 months. While this is mainly attributable to accumulating experience, it is in no small measure due to the reinforcing of fast-wearing parts with hard wearing material.

The importance of lubrication, inseparable from things mechanical, cannot be overstressed. We may as well admit that in gasworks it is very often a haphazard operation. At Howdon we are fortunate in that the amount of machinery to be lubricated is so large that we can economically employ two men to spend the whole of their time regularly and systematically greasing or oiling rollers, idlers, valves and unattended machinery according to a properly drawn up schedule. Only the straightforward routine such as filling of cylinder oil lubricators, etc., is done by shift men attending machines, all gear boxes, main bearings, hydraulic systems, etc., being the responsibility of one of the greasers. These men are supplied with good containers for their materials and some thought and expense has gone into the provision of modern lubricating appliances.

We could, I think, profitably make more use of the modern tools which are now available. To quote only a few examples, there are the modern lightweight ring spanners, small multi-purpose hydraulic jacks, bogies, etc., made from light alloys and handy light tubular scaffolding.

DISCUSSION

Mr. J. C. Graham (President, Gateshead-on-Tyne) stated that the chromium plated mesh supplied to the Redheugh Works had been fitted to one of the input chutes to the buffer hopper from the Lefleurve coke conveyor and had so far outlasted three ordinary mesh mats fitted in a similar position without showing any appreciable signs of wear. However, if the price (£20) was to be justified, it must outlast some nine or 10 ordinary mesh mats. It was also interesting to mention that a chromium plated wearing plate had been fitted in the conveyor trough and up to the present had handled 10,500 tons of coke without sign of wear. He would be glad if Mr. Waiton would give more details of the repair kits he mentioned for band conveyors.

Mr. Waiton stated that most suppliers of conveyor belt would also supply small repair kits, complete with knife,

scissors, etc., and the necessary patching material for as little as £17 to £18.

Mr. W. Henderson (Newcastle) said he would like to know what degree of supervision of the maintenance men there was, and if the numbers of men given in the paper included turners, platers, etc. He also asked if any splicing of belts was done by works personnel.

He was interested in the type of feed used onto the belt conveyors and suggested that the minimum of side plates on a band conveyor was the most ideal and mentioned that he had found hard wood quite suitable for this purpose and it was cheap. He then suggested the use of water jets for cleaning the dust off band conveyors. Vitreolite tiles had been found quite satisfactory under impact, but, he pointed out, they would not stand wear. Lastly he asked, what were the sizes of the screen mats, since he had found that only the first 18 in., which was the point of impact, were really worn out, and whether the screens were of the single or double deck type.

Mr. Waiton replying, said that the fitters were under an engineer, a foreman and a chargehand, and the number given in the paper included all the skilled workers.

Vulcanising was always done by experts employed by the manufacturers of the belt and only small patching was carried out by the maintenance men. Nearly all the feeds to the band conveyors were arranged to flow naturally with the travel of the belt, but where side feeds were unavoidable, efforts had been made to direct them to the line of travel of the belt. Water for cleaning belts had not only the difficulty of dealing with the sludge but was liable to end in wet coke and bad screening.

All the bunkers on the plant were lined with tiles and the screens were all single deck. He agreed with Mr. Henderson that it was the point of impact on screens meshes which took the most wear and consequently the mesh had been divided into three mats instead of the original two.

Mr. W. R. Garrett (Newcastle) said that Mr. Waiton was learning the hard way, by experience, and although this was very commendable, it could be expensive, so he suggested that everybody should take note of the experience of everybody else.

'The Whole Trouble'

Repairs and maintenance were the whole trouble with coke handling. Belt fasteners were a thing of the past and today every band conveyor installed throughout the Board was being vulcanised. Most of the coke wharf steelwork at Howdon was galvanised before installation, but due to delivery difficulties, the idler bases were not and he would suggest that galvanising was a better proposition than Mr. Waiton's method of shot blasting and metal spraying.

In most cases the disc idler was a good idea, but these were a fairly recent design. He would also suggest the use of a cage drum may tend to rap off some of the dust from band conveyors.

It was originally intended to use chilled cast iron for chute linings when the real points of wear in the various chutes had been ascertained.

With regard to the chromium plated screen mesh, it was obvious that the plating at the intersection was the trouble, whatever other explanation had been given for this. Perforated plate might, therefore, be tried and chromed after sufficient use had polished all the corners off the mesh.

In his opinion, to keep a mechanical producer running continuously for 23 months was indeed a very creditable performance, but obviously profits are still made in the retort house.

Mr. Waiton, in reply, stated that the cast iron plates used were of a special metal and, although not chilled, had a Brinell hardness of some 400 and the manufacturers claimed this metal was superior to chilled cast iron in abrasion resistance.

Mr. C. J. Sanderson (Newcastle) said that the test chromium plated screen mesh supplied to Elswick Works had only lasted 81 working days against the 35 days life of an ordinary mesh.

Mr. J. McManus (Blyth) pointed out that there were two types of maintenance, planned and emergency. Where vital plant was not duplicated it could not be maintained satisfactorily or economically, in fact in some cases it could not be satisfactorily examined.

Mr. C. H. Thompson (Newcastle) pointed out that perforated plates used on a vibratory screen would not have the same efficiency of screening as the mesh. He asked if any variation of mesh was used to change the grading size and also what was the life of the screening frame. He then suggested that it was easy to change the mesh mat within the frame *in situ*.

Mr. Waiton said that the screening elements were divided into three sections in separate frames. It was the practice to keep spare frames containing new mesh mats near every screen. A spare frame could be fitted in less than an hour by the duty fitter. Frames lasted about 12 times the life of the mat. Grading sizes had rarely been altered, which was fortunate because of extra stores which would have to be carried.

Mr. H. Nuttall (Newcastle) said that with regard to glass or vitreous material for lining chutes, a study of impact convinced him that if it would not stand up to continual impact then the bedding material was at fault. Abrasion would be the only trouble. He then suggested the use of alumina spraying.

Mr. Waiton said that the vitreous material was fixed by the suppliers and it cracked. A trial of alumina spraying was under consideration at the present time and also the use of toughened glass had been considered.

Mr. H. Buckley (Newcastle) was very interested to see that modifications were applied at the suggestion of the maintenance men and that the author had given credit where credit was due. He felt this signified a happy unit with everybody pulling their weight. He advocated the use of perforated plate for screening which, although not quite as efficient, could be kept clean, and this was no easy matter with mesh screens. He felt the need for more organised experimental work to make sure that the same things were not discovered on several works which would be a waste of time and money. He agreed with Mr. McManus on the risks and cost involved in the lack of duplicate machinery in vital points.

Mr. Waiton said that the debreezers were using perforated plates quite satisfactorily but they only handled previously screened coke at the hopper outlets.

Mr. J. T. Lewis (Howdon-on-Tyne) pointed out that the angle of slope of the screens is such that the type of mesh now used is essential to retard the speed of the coke for efficient screening. If a polished perforated plate was used it would be more like a chute than a screen.

Mr. Henderson (Newcastle) asked if all machinery for handling was sequence controlled and if any provision was made for anti-breakage chutes in hoppers and bunkers.

Mr. Waiton said all handling plant was sequence switched and no anti-breakage chutes were used.

Mr. Garrett (Newcastle) pointed out to Mr. Henderson that since the coke at Howdon was made in intermittent chambers and was very hard compared to continuous vertical retort coke, it did not suffer breakage in hoppers. He further suggested that plates could be cut similar to mesh, but that the joints would not interfere with the plating.

A member stated that the use of toughened glass was out of the question as it was purely a surface hardness and once this surface had been scratched it would be worn away in no time.

Mr. J. F. White (Deputy Chairman, N.G.B.) congratulated the author on an excellent paper and said it was like a breath of fresh air to hear of thought being used at all levels throughout the works. Mr. Waiton seemed to be a member of the school who do it first and ask permission afterwards, and he felt he had to mention that the Board seem to get more suggestions from Howdon than any other works.

Cannot Afford Duplicates

Mr. Waiton was actually getting on with maintaining a vital piece of plant instead of asking for a duplicate. He did not like to see all this duplicate machinery lying idle in case of breakdowns and at the present time he considered we could not afford it. He felt that if a gas engineer was given the captaincy of a ship at sea, he would immediately ask for a duplicate ship to trail behind in case of a breakdown.

Mr. Waiton acknowledged Mr. White's comments on the Howdon works and pointed out that a ship in trouble could 'heave-to' but he could not imagine what Mr. White would say if the Howdon works had a 24-hour 'heave-to.'

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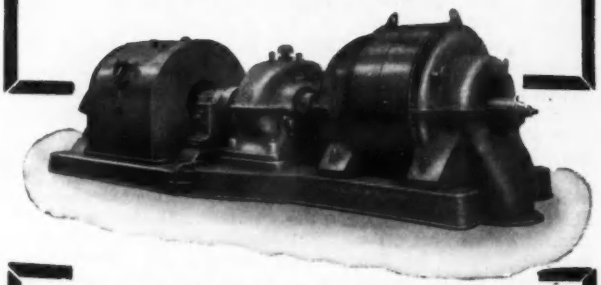

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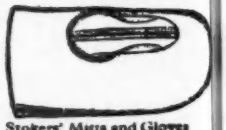
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(GAS COMMITTEE)

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M. MAGUIRE,
Secretary.

APPOINTMENTS VACANT

UNIQUE opportunity. GOVERNOR DESIGNER required by London firm for sales promotion, design and industrial application surveys. Write full particulars, qualifications, experience, age and salary required. No. 315, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

A SALES REPRESENTATIVE is required by Lancashire manufacturers of approved Gas-heated Washing Appliances, to cover the Scottish Gas Board Area. Car provided. Apply stating age, experience and salary required to No. 314, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

ASSISTANT to Technical Manager required for development work on Controls and Accessories for the Gas Industry.

Candidates should have a degree in Physics or Engineering.

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APPLICATIONS are invited from Corporate Members of the Institution of Gas Engineers for the position of STATION MANAGER, Dawsholm Gas Works, Glasgow. The annual gas make of the station is upwards of 3,000 million cubic feet. The station is equipped with Woodall-Duckham Continuous Vertical Retorts, I.V.C.O.'s and with C.W.G. Plant.

The commencing salary will be within Group 'C' (£1,225-£1,425 per annum) of the National Salaries Table for Senior Officers according to qualifications and experience.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age and giving particulars of education, training, experience and qualifications, together with the names of two referees, should be addressed to the undersigned within fourteen days of the appearance of this advertisement.

A. T. HERD,
Secretary.

26, Drumsheugh Gardens,
Edinburgh, 3.

February 28, 1957.

SCOTTISH GAS BOARD

DUNDEE GROUP
JUNIOR TECHNICAL ASSISTANT (MAINS)

APPLICATIONS for the above position are invited from suitably qualified young men. The duties consist mainly of drawing office work of a topographical nature and the position offers excellent opportunities for promotion for a man with ability.

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Applications stating age, particulars of education, training, experience and qualifications and bearing the names of two referees, should be addressed to W. S. Johnston, Group Manager, Scottish Gas Board, Dundee Group, to arrive not later than Monday, March 18, 1957.

THE SCOTTISH GAS BOARD

SOUTH EAST DIVISION
FALKIRK DISTRICT
APPOINTMENT OF TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the Gas Works, Falkirk. Applicants must possess a sound technical and practical knowledge of gas manufacture in Glover-West continuous vertical retorts and usual ancillary plant.

The salary offered is A.P.T. 8/9 'A' (£710-£855) per annum. A house is available at a reasonable rent.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age and giving particulars of education, training and experience, and qualifications, should be addressed to the District Manager, Falkirk, to arrive not later than Saturday, March 16, 1957.

WM. EWING,
District Manager.

Gas Works,
Falkirk.

February 28, 1957.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
APPOINTMENT OF HOME SERVICE ADVISER OR TRAINEE—GRIMSBY GROUP

APPLICATIONS are invited from suitably qualified persons for the above appointment. Candidates should hold a recognised diploma in plain cookery and/or domestic science, be able to conduct demonstrations, give lectures, and be capable of promoting the use of gas appliances and of advising consumers on kitchen and other domestic problems involving the use of gas.

The salary will be within Grades S.G. 4/5 of the National Salary Scales for Gas Staffs (£316/£580 p.a.) according to qualifications and experience.

Consideration will be given to accepting a young lady without practical experience as trainee providing she has successfully completed a recognised course of study in domestic science, in which case the commencing salary may be lower than the range indicated above.

The successful candidate will be required to pass a medical examination and will also be required, if eligible, to join the Board's Staff Pension Scheme.

Applications stating age, qualifications and experience and giving full particulars of training together with the names of two referees should be addressed to reach the undersigned by not later than March 23, 1957.

BERNARD CLARKE,
Divisional General Manager.

Belle Vue House,
Carline Road,
Lincoln.

March 1, 1957.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION
INDUSTRIAL GAS REPRESENTATIVE

APPLICATIONS are invited for the above position. Candidates should have experience in industrial and commercial gas utilisation and a knowledge of the comparative costs and merits of other fuels.

Possession of the Institution of Gas Engineers Higher Grade Certificate in Gas Engineering (Supply) or equivalent qualification would be advantageous.

The salary will be within A.P.T. Grade 8 (£710-£790 per annum) of the National Salary Scales for Gas Staffs. The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham, 3, to reach him by not later than March 18, 1957.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION
FOREMAN FITTER, BILSTON

APPLICATIONS are invited for the above posit The successful candidate will be responsible supervising the work of craftsmen engaged in m taining the mechanical and electrical equipment the Works. Candidates should have experience the control of labour and in the maintenance steam raising plant, conveyors, hydraulic equip ne motor vehicles and electrical switchgear.

The salary will be within A.P.T. Grade 7 (£6 £750 per annum) of the National Salary Scales Gas Staffs.

Applications, stating age, qualifications and exp ence should be addressed to Mr. S. Jones, Divisi General Manager, West Midlands Gas Boa Kensington House, Bath Street, Dudley, to r him not later than March 18, 1957.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON AND DISTRICT DIVISI
SHIFT SUPERINTENDENT,
WOLVERHAMPTON

APPLICATIONS are invited for the above posi at the Wolverhampton Gas Works from candid with experience in the operation and maintenance W.D. Vertical Retorts. Possession of the Ordi or Higher Grade Certificates in Gas Engineering be an advantage.

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Applications, stating age, education and experie together with the names of two referees should addressed to Mr. S. Jones, Divisional Gen Manager, West Midlands Gas Board, Bath Str Dudley, to reach him not later than March 18, 19

J. C. INGRAM,
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NORTH WESTERN GAS BOARD

LIVERPOOL GROUP
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APPLICATIONS are invited for the above pensi able appointments at salaries within Grade A.P 7/8 (£670/£790 p.a.).

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Applications should be made in writing to t Chief Personnel Officer, N.W.G.B., Liverpool Grou Radiant House, Bold Street, Liverpool 1, within days.

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NORTH EASTERN DIVISION

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Applications giving details of experience and a qualifications should reach the Group Gener Manager, North Eastern Gas Board, Britannia Ho Bradford, by March 16, 1957.

J. C. GARDNER,
Secretary.

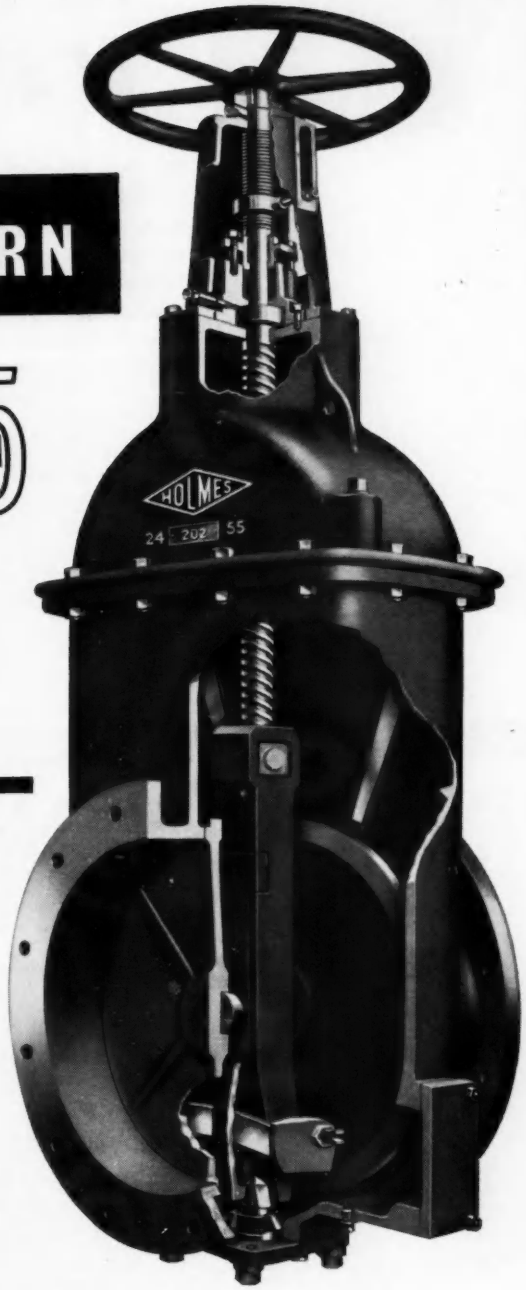
Specify

HOLMES-WESTERN

Valves

55 PATTERN

The Holmes-Western Valve is of the double disc parallel slide type and has been specifically designed for the Gas and Coking Industries.



British Patent No. 758253.

Holmes-Western Valve.
Type 204 - 12" 'Horizontal' with indicator.

Write for copy of Publication No. 52/5

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for accurate control of air blast systems

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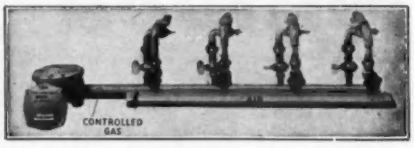

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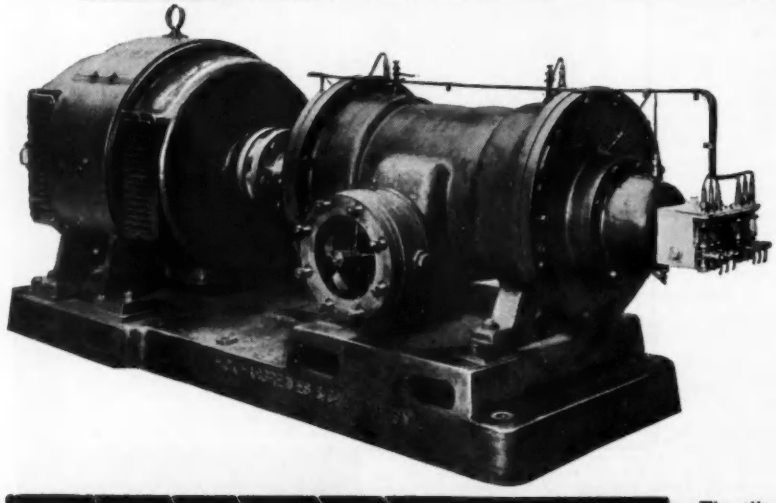
ROTARY COMPRESSORS



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The illustration shows an air-cooled Compressor for 15 p.s.i.g. Also available as a water-cooled machine for h.p. distribution.

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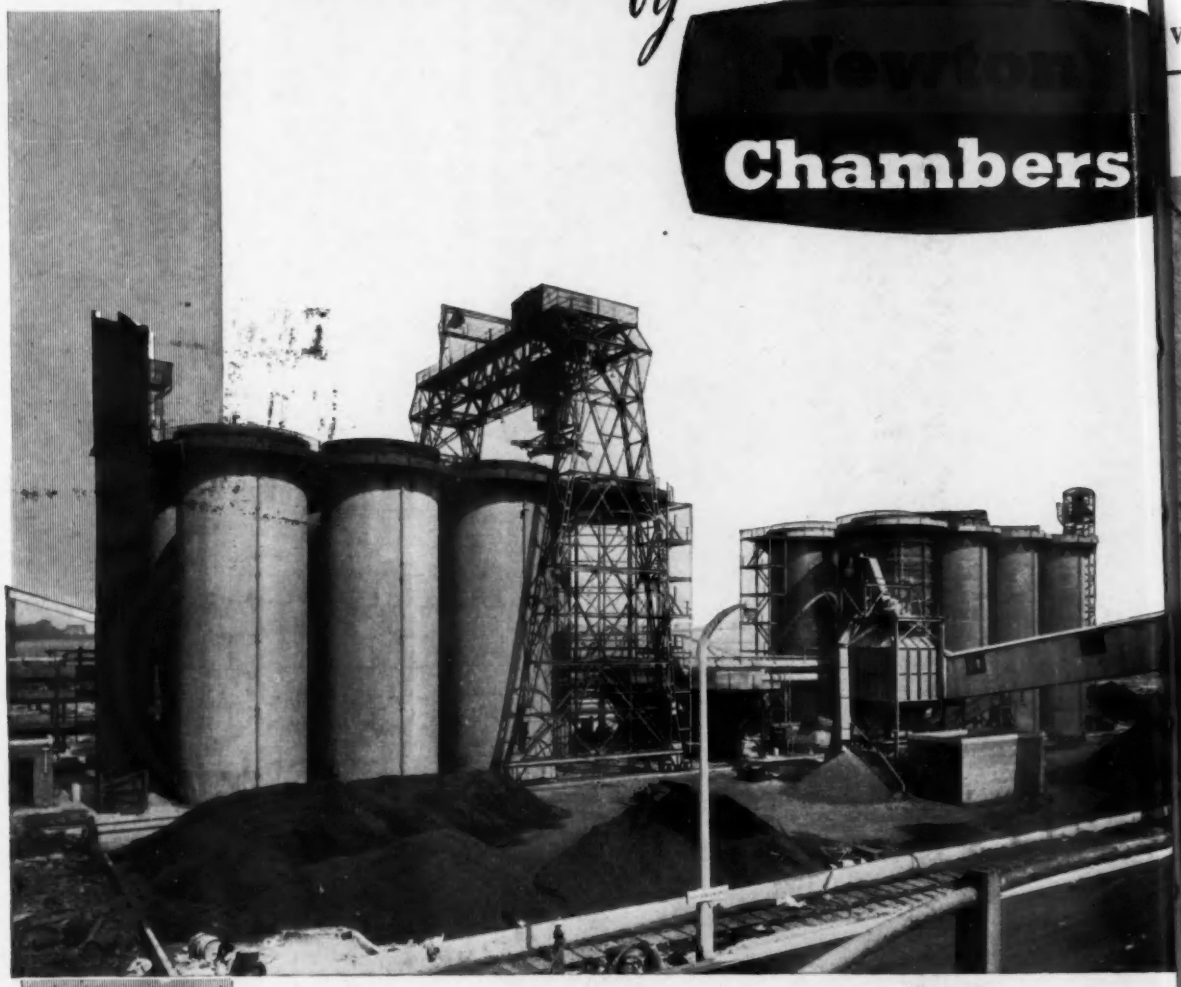
TOWER PURIFIERS *by* Newton Chambers



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